# PAPER TRADE JOURNAL

THE INTERNATIONAL WEEKLY OF THE PAPER AND PULP INDUSTRY AND THE PIONEER PUBLICATION IN ITS FIELD



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JUNE
16
1938

Vol. CVI
No. 24

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Entered as second class matter at the Post Office at East Stroudsburg, Pa., under the Act of Congress of March 3, 1879. Published every Thursday by the Lockwood Trade Journal Co., at 34 N. Crystal St., East Stroudsburg, Pa. Executive and Editorial office: 15 W. 47th St., New York, N. Y. Domestic subscription U. S. and possessions, $4.00 per year.

*Through The Centuries With Alkalies*

Called the founder of the English Alkali industry, James Muspratt built the first soda plant in England, at Liverpool in 1823. Soon afterwards he erected other plants in Lancastershire, adjacent to coal fields and salt deposits. Muspratt used the LeBlanc process. At first the soap and glass manufacturers were suspicious of this "British barilla", but later the demand became so great the crude furnace product was sent off hot as soon as it was drawn.

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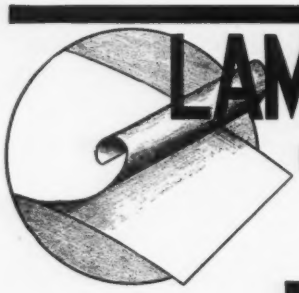

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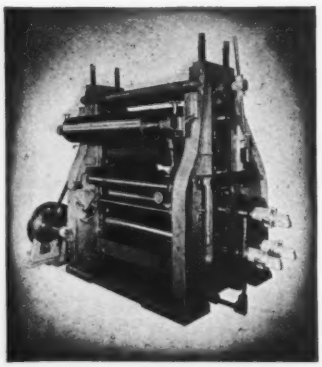

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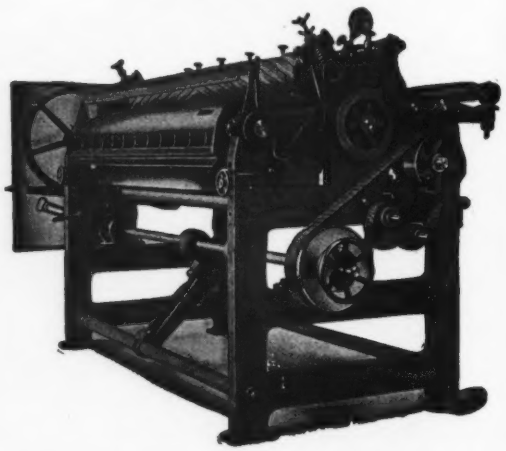

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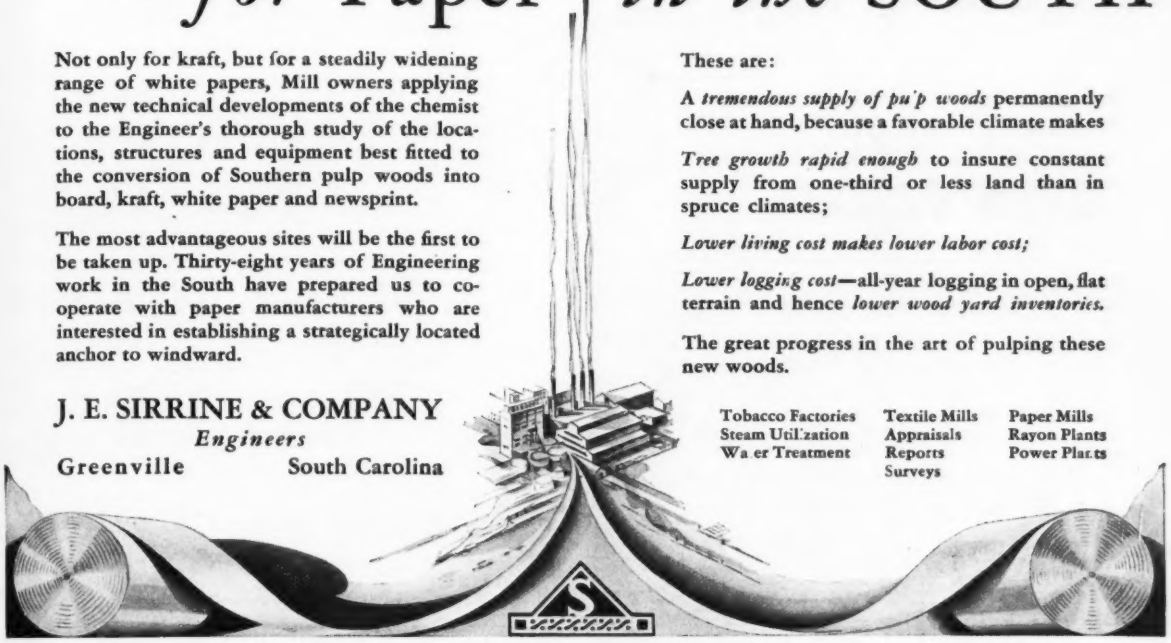

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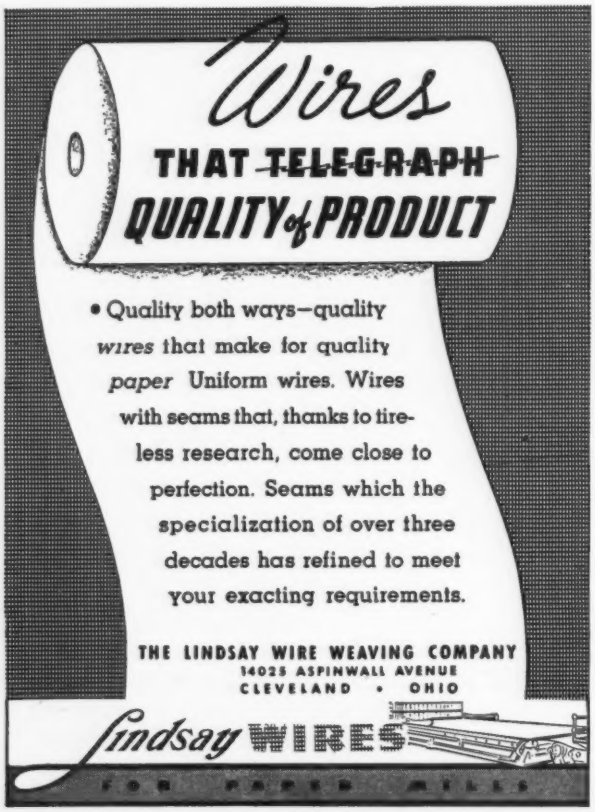
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# PAPER TRADE JOURNAL

THE INTERNATIONAL WEEKLY OF THE PAPER AND PULP INDUSTRY AND THE PIONEER PUBLICATION IN ITS FIELD

Published Every Thursday by the LOCKWOOD TRADE JOURNAL CO., Inc.

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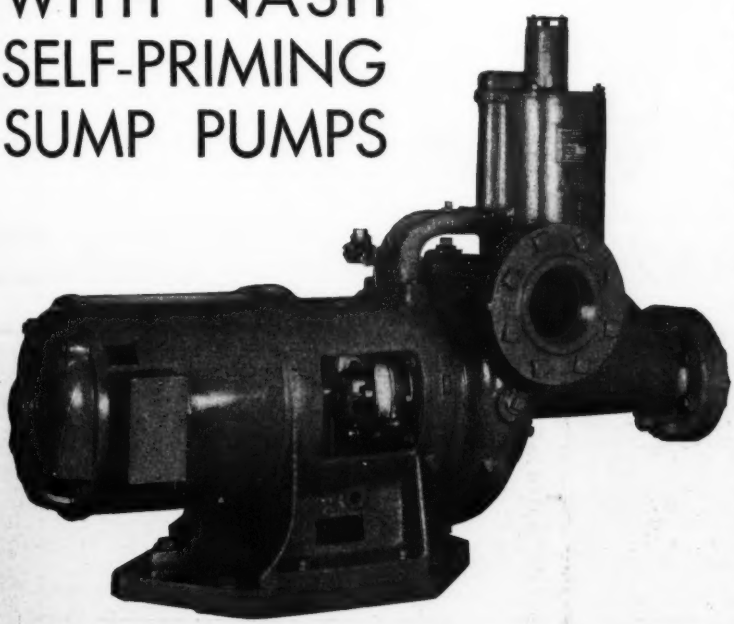
NO WORKING PARTS SUBMERGED WITH NASH SELF-PRIMING SUMP PUMPS



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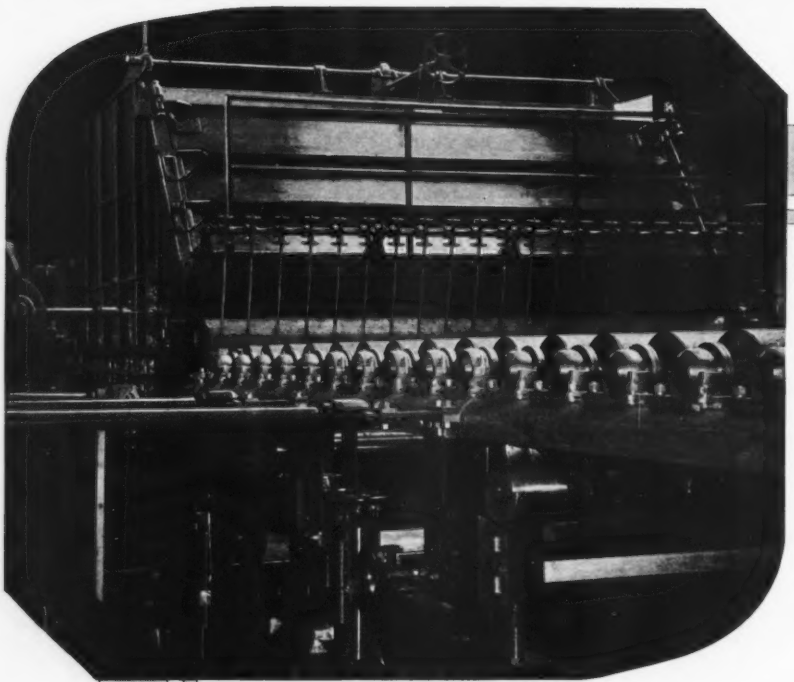
# At last . . . a flow box design that meets all requirements



If you are looking for a flow box that offers new simplicity of design and ease of operation, Black-Clawson has the answer.

For example, their new flow box is of the single compartment type, with a midfeather . . . the most effective design yet developed to reduce stock currents and to keep the fibers well separated. Raise the midfeather . . . by conveniently located controls . . . and the formation appears lumpy and streaked. Lower it to the correct position and the formation is immediately and completely cleared.

The B-C flow box is made entirely of metal . . . no wood being used anywhere. The ends are of cast iron or steel and the interior is of non-corrosive metal supported by structural steel. The midfeather, too, is of non-corrosive metal and may be obtained in stainless steel, Monel metal, or bronze.

The important features of this new flow box . . . non-corrosive metals, simplified design, and easily reached controls . . . are typical of the other new Black-Clawson Fourdrinier improvements. We refer in particular to the specially designed Kutter formation table and to the multi-sectional table roll section, both the result of extensive research.

Like the flow box, these exclusive B-C developments enable you to obtain greater operating efficiency without the usual heavy investment. More complete information on the Black-Clawson "step-by-step" Fourdrinier modernization plan can be had by writing the Black-Clawson Company, Hamilton, Ohio, Owners of Shartle Bros., Middletown, Ohio.

BLACK-CLAWSON

# PAPER TRADE JOURNAL

Reg. U. S. Pat. Off.

SIXTY-SIXTH YEAR

PAPER — PULP

Established Feb. 17, 1899
Consolidated Nov. 16, 1899
with Paper Trade Journal.

Vol. CVI, No. 24 — Thursday, June 16, 1938

Established Sept. 21, 1918
Consolidated Feb. 19, 1925
with Paper Trade Journal.


# Canadian Newsprint Mill Formally Opened

## Giant $30,000,000 Plant at Comeau Baie on St. Lawrence River Dedicated to Paper Industry With Appropriate Ceremonies—American Publisher and Large Number of Distinguished Visitors Present at Opening.

[FROM OUR REGULAR CORRESPONDENT]

MONTREAL, Que., June 13, 1938—The new newsprint mill built at Comeau Bay, Que., about 400 miles east of Montreal, on the north shore of the St. Lawrence, for the supply of newsprint for the New York Daily News was officially opened on Saturday by the Hon. Maurice Duplessis, Premier of Quebec, in the presence of a distinguished gathering representing leaders of industry, of the Church, and of the State.

### Prominent Men Eulogize Work

Premier Duplessis said the occasion marked the happiest day of his life, because it demonstrated the great value of co-operation between Catholics and Protestants, governments and industry and capital and labor. He remarked that he was astonished at the development at Baie Comeau. It was obvious, he stated, that the same spirit which had brought the enterprise to a successful fruition was still evident, and all was well under way for the completion of the town. He noted with pleasure that sites for churches and schools would be given free.

It was apparent to him that the human factor had not been ignored, but was recognized as most essential, and that labor conditions in the town were excellent.

Then Premier Duplessis made an important announcement respecting the relations of the Provincial Government with the newsprint industry. He said there was no doubt the industry was suffering. The Comeau Bay plant could always count on receiving justice from his Government, but the time had come to notify all concerned that there must be stability. The newsprint situation was to be considered from a public point of view, and not as a matter of each company's interests. To allow each United States newspaper to do what the Ontario Paper Company had done would be to permit a situation detrimental to the province.

He asked for co-operation between publisher and newsprint manufacturer. The wealth of Quebec could not be sacrificed, and justice must be given to all in dealing with that complicated problem, the Premier stressed. Many things entered into the newsprint problem, "and we will view this problem and its various angles in the light of the fact that we have a mandate to preserve this patrimony of ours, and we will do so, giving justice to all at the same time.

The Hon. Pierre Casgrain, Speaker of the Dominion House of Commons, in congratulating the sponsors of the enterprise on their successful achievement, said: "In Canada, today, and on the American continent, we are interested in co-operating to develop our natural resources and add to the wealth of our people.

"The Dominion Government is keenly interested in this Quebec project and only pressure of work during the final days of the Dominion session has prevented other members of the Government from attending this function today."

### American Publisher a Central Figure

Taking an important part in the official opening were Colonel Robert R. McCormick, publisher of the Chicago Tribune, and guiding hand behind the construction of Baie Comeau, and Arthur A. Schmon, president of the Ontario Paper Company.

Mr. Schmon traced the history of the enterprise and announced that the name of the company would be changed with Quebec incorporation.

Central figure behind the enterprise, Colonel McCormick, who financed the entire project, which he first visualized about 25 years ago, received a rousing welcome when he addressed the gathering in a slow—but fluent—French. He, too, paid tribute to those whose co-operation made the development possible.

"I say to those who are taking over the mill now, the pioneers set up an example here it will be hard to follow. The fight against the forest is not ended with the opening of the mill, it has just begun. We still have many problems, he said.

"Comeau Bay must be an important forest enterprise as well as an important paper mill. It must also be a city of numerous enterprises of which the company will have no part. These advantageous developments which might result from the present situation will be left to those who will undertake them. Comeau Bay will become an important centre in Canada. It looks to the future. We hope to see established here the best schools possible for a town of this importance. It is my great desire that the teachers should prepare the youth of this new city

*(Continued on page 17)*

# Wausau Paper Mills To Resume Operations

## Destruction of Hydro-Electric Plant By Flood at Loss of $750,000 Will Not Stop Production at Wausau Paper Mills Plant—Company Plan to Use Old Dam and Get Power From Public Service Lines—Other News.

[FROM OUR REGULAR CORRESPONDENT]

APPLETON, Wis., June 13, 1938.—By utilizing for the time being an old wooden dam replaced in 1923 by one of steel and concrete, and making temporary power connections with the lines of the Wisconsin Public Service Corporation, the Wausau Paper Mills Company, Brokaw, Wis., expects to be back in production within about ten days, according to announcement made last week by Ben Alexander, president, following a meeting of the board of directors.

In the meantime an extensive study will be made before the concrete dam and a new hydro-electric plant are built to replace the company's modern plant which collapsed about two weeks ago and was dropped out of sight in the Wisconsin River, taking with it three gates of the dam. The loss was estimated at $750,000.

"Conservative business proceedings would be to keep the mill shut down until the economic clouds lift," Mr. Alexander declared, "but to keep Brokaw, in which village we have operated the mill for 35 years from becoming a ghost town, we are going to take a gamble. We are also considering the welfare of the 300 families dependent upon the mill for a livelihood."

### Money Obtained To Finance Repairs

Money to finance the necessary repairs was obtained through good banking connections and by cash advances from a selected group of stockholders, President Alexander said. By rebuilding the old coffer dam, the water supply will be sufficient for the mill, for running the beater lines and a. c. motors and float the pulp wood.

Besides the extensive study before rebuilding the concrete dam and the hydro-electric plant, engineering scrutiny will be given the present steam plant at the mill, which at the present time is equipped with high pressure boilers, and is not adequate in capacity to operate the mill.

Sales connections for the mill have been maintained as usual, and rush orders have been filled by the Marathon Paper Mills Company at Rothschild, Wis. The company had built up a good sale for its high grade sulphite bonds since abandoning cheap wrappings several years ago, and the stockholders have put approximately $500,000 cash into the mill, and into a sawmill. The mill has been under the management of W. B. Clements since the changes were made.

In addition to the directors, last week's meeting was attended by L. E. De Guerre of Wisconsin Rapids, Wis., consulting engineer, and Hugo Anders, vice-president of the First National Bank of Chicago.

### Kimberly-Clark Adopt Four-Day Schedule

All production departments of the Lakeview and Badger-Globe mills here except the belt and Kotex converting divisions of the Kimberly-Clark Corporation have been placed on a four-day operating basis, cutting operations from the five-day week schedule recently adopted. The curtailment was made, according to William Kellett, mill manager, to control mounting inventories of finished stock. The belt and Kotex converting departments will remain on a 5-day week basis. The changes were announced at meetings of the employees, with the further explanation that the work would be spread as equitably as possible among all workers.

### Graduates of Paper Chemistry Get Degrees

Five doctor and twelve master degrees were conferred on students of the Institute of Paper Chemistry, affiliated with Lawrence College, Appleton, Wis., at commencement exercises this morning. Although the Institute has been operated for approximately ten years, William J. Foot, Jr., of Appleton, Wis., is the first Lawrence College graduate to receive an Institute degree. All others have been graduate students from other institutions throughout the United States.

Mr. Foot received his bachelor of arts and master of science degrees from Lawrence College, and will receive his doctor of philosophy degree on his thesis, "An Investigation of the Optical Scattering and Absorption Coefficients of Dyed Handsheets and the Application of the ICI System of Color Specification to These Handsheets."

Others who received doctor of philosophy degrees, and the subject of their these are: Earl Bruce Brookbank, Jr., Seattle, Wash., "Sulphite Pulping of Douglas Fir," (University of Washington); James W. McIntyre, Freeport, Pa., "The Development of a Quantitative Technique for the Evaluation of Color Stability of Bleached Pulps and the Influence of Natural Aging and Drying Upon This Evaluation," (Pennsylvania State College); John P. Weidner, Paxton, Ill., "The Influence of Humidity on Changes in Diameter and Length of Sulphite Fibers," (University of Illinois); John C. Wollwage, Chicago, Ill., "An Investigation of the Flocculation of Paper Making Fibers," (Northwestern University).

Students who received the master of science degrees are: Carl E. Ahlm, Minneapolis, Minn. (University of Minnesota); Henry J. Allison, Jr., Charlotte, N. C. (University of North Carolina); Paul C. Baldwin, Teullen, N. Y. (Syracuse University); John W. Bard, Antigo, Wis. (Iowa State College); John Calvin Bletzinger, Coraopolis, Pa. (Alleghany College); Ralph E. Glading, Lorain, Ohio (Oberlin College); William S. Grimes, Gillespie, Ill. (Washington University, St. Louis); Robert D. Hinkel, York, Pa. (Pennsylvania State College); Harold H. Houtz, Niagara Falls, N. Y. (Rensselaer Polytechnic Institute); Robert W. Miller, Drums, Pa. (Pennsylvania State College); Robert O. Ragan,

*(Continued on page 16)*

# May Reorganize Lake Sulphite Pulp Co. Soon

## American and Montreal Financial Interests Reported to be Impressed With Possibilities of Property—Plans Include New $3,500,000 Issue of Mortgage Bonds—Arnold Ashton Heads Wallpaper Manufacturers Ltd.

[FROM OUR REGULAR CORRESPONDENT]

TORONTO, Ont., June 14, 1938—The belief is expressed that in the near future there will be a financial reorganization of the Lake Sulphite Pulp Company, Limited, Red Rock, Ont., which some months ago went into liquidation. It is expected that within a few weeks definite arrangements will be made. There is however no need for haste as the pulp situation just now is far from bright and the contracts originally held by the Lake Sulphite Company are regarded as having no value at this time. Before the end of the year it is hoped that the sulphite pulp market will take a turn for the better and at the beginning of 1939 it will be possible to line up new contracts. No work of any consequence has been done at the site of the more than half completed enterprise at Red Rock since financial trouble overtook the concern and orders went out to cease operations.

It is understood that two groups are studying the factors in supplying the necessary capital to lift the receivership of the company and place the property in operation. A party of American financial interests is reported to have investigated the affairs of the company and is impressed with the potentialities of the property to such an extent that they are willing to put up new capital and complete the project. A second group of Montreal interests has also made considerable progress with plans to do the same thing. The identity of the American group is kept closely guarded as also is the case with the Montreal men. A group of pulp wood buyers has made an offer to buy a large quantity of timber from the Nipigon limits but it is only a small portion of the limits acquired from the Canadian International Paper Company and the price is said to be in excess of what the company paid for the whole Lake Nipigon property.

### May Issue Mortgage Bonds and Stock

The underwriting of the $3,500,000 of first mortgages bonds may under these circumstances be accomplished without difficulty and the Montreal group has plans for that. It is unlikely that the note issue which was sold privately will be disturbed. In addition to the funds to be received from the underwriting of the bonds, about $1,250,000 will be required to complete the project which will have to be raised through the issue of common stock. This means that the new interests putting up the money will want control of the company. The existing shareholders consequently may be asked to make some sacrifice if the new money is forthcoming. One plan is that the present shareholders be given the chance to subscribe to stock on practically the same basis as the syndicate.

### Ashton Heads Wallpaper Manufacturers, Ltd.

Arnold Ashton, who has been closely associated with the operations of Canadian Wallpaper Manufacturers, Limited, Toronto, since its formation as director and secretary-treasurer, has been appointed president of the organization. He succeeeds G. A. Orme, who has resigned. John T. Chasney is vice president and John Prescott, who has been assistant secretary, has been made secretary-treasurer. Canadian Wallpaper Manufacturers had a profit for the year ending April 30, 1938, of $143,434 from the subsidiaries companies, $56,714 earned by the parent company under agreement with the subsidiaries and $5,335 interest on loans, or $205,383 in all as compared with $211,162 in 1937. After bond interest and expenses, the net profit was $157,419 as against $165,925 the preceding year. After deducting dividends of $129,246 or $1 a share, earned surplus went up during the year from $469,682 to $497,885. The first and final dividend recommended for 1938 will be paid on July 11 to shareholders on record, July 4, at the rate of $1 a share, just as in 1937-38. During the year the company paid off the residue of the 7 per cent collateral trust serial bonds to an amount of $112,000. To finance this operation and to provide building needs for subsidiaries, the company during the year issued $300,000 of 4 per cent collateral trust serial bonds maturing $50,000 in each of the years 1939 to 1944 inclusive. The capital expenditures by all subsidiaries during the year was $156,003. The main expenditure was a new warehouse at the plant of the Reg. N. Boxer Company, Toronto. The current balance sheet shows current assets of $1,300,000 and current liabilities of $164,308. Current assets changed very little during the past year but a year earlier current liabilities totalled $314,390.

### Feasibility of Pulp Mill in Manitoba

After a flight over Northern Manitoba by John Bracken, premier of that province, and Col. H. I. Stevenson, forestry chief, they report that inquiries have been received as to the feasibility of building a pulp mill, possibly at Cermorant, in the northern part of Manitoba.

### Pulpwood Cutting for U. S. Active

Word received from Nipigon, Ont., states that there is much bush activity and boats are loading pulp wood for shipment to the United States. It is reported that twenty-seven boats have been chartered for carrying wood during the coming summer. Down the Nipigon river towing operations are in full force and there is much pulpwood floating in to the bay from the Sturgeon and other rivers in the area.

### Harry Nixon May Head Forests Department

It is reported that Hon. Peter Heenan, Minister of Lands and Forests for Ontario, may be made Minister of Labour, to succeed the late Hon. M. M. MacBride, and that Hon. Harry Nixon, Minister of Game and Fisheries, will take over the Lands and Forests Department in an amalgamation of the two sections of the government.

# Kraft and Book Papers Lower at Chicago

## Reduction in Prices of Some Grades of Paper Not Expected to Affect Other Grades, Which Hold Steady—Legislative Threat to Business—Midwest Salesmen's Association Members Play Golf — Other Trade News.

[FROM OUR REGULAR CORRESPONDENT]

CHICAGO, Ill., June 13, 1938—Chicago paper merchants found little to cheer about in the present news of the week. Not only was the summer period of quietness right on the heels of jobbers and manufacturers' representatives, but the price changes of the past week have been conducive to some worry though merchants here retain their confidence that any sign of improvement is going to be immediately felt in the paper trade. Book papers went off $12 a ton on stock orders and seven dollars a ton on "making" orders last week while kraft settled to a point where southern Kraft is reported at $3.50 less 5 per cent. The other lines held steadily and the indication was there that book and kraft lines had simply followed the recession in certain other grades. Bonds were steady though demand was slow. Groundwoods and newsprints showed little change according to local reports. Waste papers continued very weak with the exception of some acceleration in movement in one or two grades.

The entire market evidenced some depression over the current outlook, the threat of more taxes emanating from Springfield and of more regulation from Washington. There continues to be, however, a conviction that matters must take a right about face in the late Summer and early Fall with very low inventories as the immediate reflector of even a slight upturn in business.

### Begin Envelope Selling Drive

The Swigart Paper Company recently got under way a widely publicized drive to interest printers in the buying, printing and selling of envelopes at a time when "the profits in such items were being overlooked by many concerns". The Swigart organization used the popular "Gallery of Printed Ideas" to initiate the program with E. L. Wight, advertising executive of the United States Envelope Company, on hand for a June 1 meeting which he utilized to distribute envelope sales kits and to provide several selling suggestions to those present. Plans for the entire month of June include special exhibits of envelopes to be shown at the Gallery during that period with exhibitions of all styles and sizes of envelopes together with a generous supply of selling aids and merchandising ideas which can be adopted and adapted by Chicago concerns. The program is one of many developed in this city to counteract the slump in demand by a vigorous effort to stimulate sales, not only in new channels but in developing regularly accepted items which have fallen into the current "doldrums".

### S.A.P.I. Hold Second Golf Outing

The Salesmen's Association of the Paper Industry, midwest division, held its second in the series of 1938 monthly golf outings on Friday, June 10, at the Westmoreland Country Club. The outing is being arranged under the direction of Graham Olson, chairman, and George Craft, co-chairman. At least 60 members and guests are expected to be on hand.

### New Hinde & Dauch Product

The Hinde & Dauch Paper Company is marketing a new Bulman counter roll cutter which is said to be receiving enthusiastic acceptance in the paper market. The cutter is arranged so that stock is fed corrugated side up so that it is unnecessary to turn for wrapping.

### Legislative Threat To Business

The Illinois Legislature continues to hold its threat for the paper industry in the form of House Bill 47, a bill designed to give the various city councils and village boards the right and the power to license for revenue purposes. The industry sees in this proposal an opportunity for city councils, particularly in Chicago, to set any amount of license fees and restrictions, to further any political reciprocal measures, and, in general, to subject Illinois business not only to the tax idiosyncrasies of the Federal and State legislators but of local councils as well. A number of paper executives are expected to be in a delegation going to Springfield next week to vigorously protest the passage of the measure and to suggest, in its place, a comprehensive relief program and resultant economies in relief administration.

### Salesmen Change Meeting Location

With the idea of keeping cool during the hot summer months, the midwest division of the Salesmen's Association of the Paper Industry is going to experiment with a change in meeting places and on June 20 will hold the Monday session in the Electric Club on the 38th floor of the Civic Opera Building. The final meeting at the Sherman, at least for the summer months, will feature a June 13 showing of the sound movie "Keystone of Golf" with Horton Smith, Little, Cooper and others in the actor roles.

The Association had an interesting informal discussion at the June 6 meeting with H. E. Beck, a guest of George K. Gibson's, providing some interesting information on wheat crops, major carload movements and the general transportation picture. Mr. Beck was formerly with the Northwestern Railroad but is now identified with freight car placement in behalf of the various American railroads.

### Bermingham & Prosser List New Prices

Bermingham & Prosser Company, Chicago fine paper merchants, this week released new book paper prices covering the recent readjustments in these lines. Prices are listed for the Oxford, Peacock and other book lines of the company. Some listings include (on the four case per cwt. basis) Oxford E. F. at $7.70; Peacock Folding Enamel, $11.15; Oxford North Star, dull coated, $11.75 and Oxford Mainefold Enamel, $11.15. Prices vary in the colored stocks.

# Financial News of Pulp and Paper Industry

Holder of All Mortgages on Sherman Paper Co. Bids $31,923 For the Properties—West Virginia Profits For Six Months $1,696,690—Hummel-Ross Fibre Report Net Earnings of $374,765 — Other Financial News.

### NEW YORK STOCK EXCHANGE

High, Low and Last for the Week Ending June 15, 1938

| | High | Low | Last |
|---|---|---|---|
| Armstrong Cork Co. | 28 | 27¼ | 27½ |
| Celotex Corp. | 18 | 18 | 18 |
| Certain-Teed Products Corp. | 6⅛ | 5⅞ | 6 |
| Certain-Teed Products Corp., pf. | 24½ | 22⅛ | 22⅛ |
| Champion Paper & Fibre Co. | 19¼ | 18¾ | 18¾ |
| Congoleum-Nairn Co. | 18¼ | 16¾ | 17 |
| Container Corp. of America | 11⅜ | 10⅜ | 10⅝ |
| Continental-Diamond Fibre Co. | 6⅜ | 6⅜ | 6⅜ |
| Crown-Zellerbach Co. | 9 | 8⅝ | 8⅞ |
| Flintkote Co. | 14¾ | 13⅝ | 14 |
| Robert Gair | 3 | 2⅞ | 2⅞ |
| Robert Gair, pf. | 11¼ | 10 | 10 |
| International Paper & Power | 7⅜ | 6½ | 6⅝ |
| International Paper & Power, pf. | 29¼ | 26 | 26¾ |
| Johns-Manville Corp. | 69½ | 67½ | 69 |
| Johns-Manville Corp., pf. | 126¼ | 126¼ | 126¼ |
| MacAndrews & Forbes | 27½ | 26½ | 27½ |
| Masonite Corp. | 30½ | 29 | 30 |
| Mead Corp. | 9½ | 8¾ | 8¾ |
| Mead Corp., pf. | 57 | 57 | 57 |
| Ruberoid Co. | 17⅝ | 16¼ | 16¼ |
| Scott Paper Co. | 40⅜ | 40¼ | 40½ |
| Sutherland Paper Co. | 24¾ | 24 | 24 |
| Union Bag & Paper Corp. | 9 | 8½ | 8¾ |
| United Paperboard Co. | 4⅛ | 4⅛ | 4⅛ |
| U. S. Gypsum Co. | 70 | 66½ | 67¼ |
| U. S. Gypsum Co., pf. | 169¾ | 169¾ | 169¾ |

### NEW YORK CURB EXCHANGE

High, Low and Last for the Week Ending June 15, 1938

| | High | Low | Last |
|---|---|---|---|
| American Box Board Co. | 7½ | 6⅞ | 7½ |
| Brown Co., pf. | 17½ | 17¼ | 17½ |
| Great Northern Paper | 26¾ | 26¾ | 26¾ |
| St. Regis Paper Co. | 2⅞ | 2¾ | 2¾ |
| St. Regis Paper Co., pf. | 51 | 51 | 51 |

## Mrs. E. A. Wise Bids for Sherman Properties

[FROM OUR REGULAR CORRESPONDENT]

GREAT BEND, N. Y., June 13, 1938—Announcement is made that Mrs. E. A. Wise, holder of all the mortgages aggregating an unpaid sum of $180,163.79 on the properties of the bankrupt Sherman Paper Company at Great Bend, Felts Mills and Lefebvre together with timberlands, has made an upset bid of $31,023.16 for the properties. Accordingly, creditors have been notified to appear before Judge John Conboy, referee in bankruptcy, on June 18 to show cause why the offer by Mrs. Wise should not be accepted and the sum so paid distributed among the creditors. In the event her offer is not accepted the properties will be sold by O. Palmer Barnes, trustee, subject to her bid. Mrs. Wise, holder of a first mortgage of over $100,000, has recently acquired the other mortgages including that of the Federal Reserve Bank and her bid of $31,023.19 over and above the $180,163.79 of mortgages would make her investment over $211,000. The value placed on the properties by the appraisers is $303,876.25.

If acquired, it is understood that Mrs. Wise has a plan to bring about a resumption of operations in the mills which have been idle since early in the year.

Mrs. Wise is the daughter of the late David M. Anderson, one of the former owners of the company.

## New Power Plant to Serve Paper Mills

[FROM OUR REGULAR CORRESPONDENT]

MENASHA, Wis., June 13, 1938.—Condemnation proceedings have been started by the City of Menasha against the Menasha Wooden Ware Corporation to obtain the site wanted for a transformer station. The municipal utility is preparing to buy wholesale current from the Wisconsin Michigan Power Company, in lieu of building a new steam generating plant to supply current to paper mills.

Contracts totalling more than $47,000 have been placed. Westinghouse Electric and Manufacturing Company will install the substation regulators and equipment; Wagner Electric Company, St. Louis, the transformers, and Graybar Electric Company, Milwaukee, the cables. The Westinghouse contract also includes construction of a steel building to house the regulators.

## Hollingsworth & Whitney Buy Land

A $750 deed transferring the site of the historic powder magazine at Magazine Point from the City of Mobile to Hollingsworth & Whitney Company, paper manufacturers, was filed recently in probate court accord to the *Register* of Mobile, Ala. Sale of the small parcel of land was authorized at a City Commission meeting a number of weeks ago. Considerable property has been bought on the northern outskirts of the city by the Boston paper company, which plans to erect a large mill in the vicinity.

## Hummel-Ross Fibre Profits Up

The Hummel-Ross Fibre Corporation report for the twelve months to April 30 a net profit of $374,765, according to figures filed with SEC. For the year ended with December, net profit was $608,097.

## West Virginia Profits $1,696,690

The West Virginia Pulp and Paper Company and Subsidiaries reported a net income, after provisions for depreciation and depletion and Federal income taxes, of $300,228 for six months ended April 30. Figures are not audited and may be subject to adjustment at the year-end. Profits from operations for the six-month period amounted to $1,696,690.

## New Process For Waterproof Paper

An economical process for the production of coated waterproof paper stocks is said to have been perfected by Bert C. Miller, head of Bert C. Miller, Inc., 233 Broadway, New York, paper mill engineer. The process utilizes the application of a heat-setting synthetic resin to paper stocks, and is held to show large savings in cost of manufacture of paper board products for cartons, boxes and other containers where waterproofed stock is essential.

# Boston Paper Trade Association Holds Outing

[FROM OUR REGULAR CORRESPONDENT]

BOSTON, Mass., June 13, 1938—With approximately 125 members and guests present, the regular June meeting and outing of the Boston Paper Trade Association at the Charles River Country Club, Newton Centre, Mass., on Monday, was one of the most enjoyable ever held. Fair skies favored the party, so that the full program of outdoor sports, including golf, was run off with a large number of participants. A buffet luncheon was served at the Locker Building from 11:30 A. M. on and dinner in the Club House at 6:45 P. M.

### Robert M. Stone Calls Meeting To Order

Robert M. Stone, second vice-president, called the meeting to order after the dinner for a brief business session, at which several new members were elected as follows:— Ralph N. Humes, Morart Paper Company, Holyoke; Norman Kimball, Martin Cantine Company, Saugerties, N. Y.; James H. Sweet, American Writing Paper Company, Holyoke, Mass.; O. T. Bracken, Dennison Manufacturing Company, Framingham, Mass.

### Senior Members Presented with Wine

A feature of the post-prandial exercises was a presentation of Granada wine to Col. Charles S. Proctor, John E. A. Hussey and John W. Vivian, senior members of the organization, Col. Proctor and Mr. Hussey having served as presidents. W. J. McLellan, chairman of the golf committee, who had been awarding the prizes called these gentlemen to appear at the front when the presentation was made. The presentation was followed by the singing of "He's A Jolly Good Fellow." All recipients showed appreciation, Col. Proctor speaking felicitously.

### Winners of Outdoor Sports

A. P. Carter made the announcements of the winners in the outdoor sports.

Horseshoes (Mr. Carter in charge) First prize, Royal P. Teele, bookends; second, Lee Hulett, Chemical Paper Manufacturing Company, card receiver; guest prize, Herbert A. Lindenberg, Paper Mill, cigarette box.

Putting (F. W. Masselink in charge) First, Frederic W. Main, electric clock; second, F. Bendel Tracy, cigarette case.

Bowling (W. C. Ross, chairman of outdoor sports committee, in charge) First, Charles A. Shaw; second, William C. Ross, stationary cigarette lighter.

The jobbers won the ball game over the manufacturers by the close score of 12 to 11, with F. Bendel Tracy and A. P. Carter as respective captains. Willard H. Loud was umpire. Prizes were a carton of cigarettes to each player. A feature of the game was a three-bagger by Capt. Tracy for the jobbers. The ball game was in charge of P. M. Beach.

Prizes for the golf were awarded by W. J. McLellan, committee chairman. Graham Blandy, 2nd, won the Championship Cup for the first net, Class A, with other awards as follows: Second net, Edward D. Bement; third net, George Olmstead; fourth net, E. E. Ketcham; first gross, W. Edwin Porter, Jr. Class B, low gross, J. J. Levis; first net, James Dwyer; second net, Maurice A. Park; third net, E. M. Hughes; fourth net, Edw. Sussenguth. Kicker's handicap, E. L. Cummings. Best selected nines, William N. Stetson, Jr. Guest's first prize, W. A. Buckhauser; second, H. W. Fowler. Most sevens, Frank B. Cummings. Most eights, Leon M. Poore. Most nines, Lewis L. Claflin. Most doubles, Hubert W. Lockhart.

In a drawing, R. M. Beckwith received a set of clubs, with bag and irons.

### Officers of the Club

Officers of the club are John L. Hobson, first vice-president; Robert M. Stone, second vice-president; T. Charles Casey, treasurer; John H. Brewer, secretary.

## Baker Tractor Trucks

A general catalogue, No. 50, has just been issued by the Baker Industrial Truck Division of The Baker Raulang Company, 2168 West 25th street, Cleveland, Ohio. Founded in 1853, the company built electric vehicles in 1898 and produced the first Baker industrial truck in 1917. In this catalogue the merits of the Baker tractor trucks for industrial uses are described. The line includes elevating trucks from 2 to 5 tons capacities; a Hy-Lift type, of like capacities, designed to be used wherever skid loader material must be tiered; Fork trucks, which are one of the most useful types of all powered trucks, and may be equipped with a wide variety of forks for handling wood pulp, paper rolls, etc. in capacities from 2,000 to 18,000 pounds, is also included. Other models include powered platform trucks, the Utility design having large, clear platform space in a relatively short length, for handling large units, such as rolls of paper; tractors for industrial hauling in three and four-wheel models and cranes in narrow and wide models. Several designs of specialized trucks are also described, including a special paper handling truck which picks up rolls and deposits them in racks in aisles but little wider than the truck.

## Efficiency of Colored Paints

The Skybryte Company, Cleveland, O., manufacturer of "Skyco" paints, sounds a new note in its April catalogue by presenting the advantages of color as an important factor in industrial plants. The value of color, not only for windows and interior of the plant, but color for the machinery is also considered as a practical means to reduce eye-strain, relieve nervous tension, stimulate physical energy, etc. The company's various paint products, such as Wall-Bryte, Mill-Bryte, machinery enamel, concrete floor paint, Rust-tox, heat resisting aluminum and No-glare window coating are described.

# Frank Vaughan Heads Paper and Twine Club

[FROM OUR REGULAR CORRESPONDENT]

The Paper and Twine Club held its annual meeting and election at the Spink-Wawasee Hotel, Lake Wawasee, Ind., on Monday and Tuesday, June 6 and 7, 1938. Frank Vaughan of the Bay West Paper Company, Green Bay, Wis., was elected president, to succeed Jack Wittrock of Cincinnati. Ed Magel, president of Crescent Paper Company, Indianapolis, Ind., was elected vice president and John L. Richey was reelected secretary-treasurer.

### The Board of Directors

The board of directors which was elected at the meeting consists of Stanley H. Andrews of H. P. Andrews Paper Company, New York, J. E. Alcorn of the Alling & Cory Company, Cleveland, Ohio; Leo Altholz of Inlander-Steindler Paper Company, Chicago; F. T. Jamison of Interstate Cordage and Paper Company, Pittsburgh, and Charles A. Shaw of Whitney Brothers Inc., Boston, Mass., these five representing the jobbers. The manufacturers are represented by E. E. Brown of Superior-Lawrence Bag Division of the Sorg Paper Company, Middletown, Ohio; Andy Maish of Dennison Manufacturing Company, Framingham, Mass.; H. R. Telfer of Detroit Sulphite Pulp & Paper Company, Detroit; Neil Nash of Nekoosa-Edwards Paper Company, Chicago; Tom Fletcher of Fletcher Paper Company, Alpena, Mich.; H. S. Daniels of Union Bag and Paper Corporation, New York, and Henry Savage of International Paper Company, New York.

On Tuesday morning, the members present authorized the executive committee of the club to name an executive council on policy, to receive suggestions for programs other than mere social activities of the club and report back its recommendations to the membership, either at its next meeting or by means of a mail vote to determine upon some plan of constructive activity.

### Calls Meeting for June 28

The newly elected president is calling a meeting of the executive committee in Chicago for June 28, and will call upon certain of the other members to counsel with him in the name of this representative council on policy, two major activities having already been selected, one of them having to do with getting back of a national paper week, educating the public as to the uses of paper, in hope of developing a wider use of paper and paper products. The second has to do with a program of carrying on a school for salesmen, both of which plans will be submitted to the new council when formed. Also, an enthusiastic resolution was passed, extending a vote of thanks to the meetings committee for their success in handling the meetings of the organization during the past year.

At the Monday morning session where the jobbers and wholesalers of the Club met in separate session, resolutions were passed approving the plan of the Gummed Industries Association in forming and operating their Certified Products Bureau, through which they are endeavoring to put a floor specification as to quality of gummed tape so that the public may not be deceived by sub-standard products. A resolution was also passed, approving the program of the Tissue Association on their label program which has been established to insure buyers of wrapping tissue of getting the proper furnish, size and weight on this commodity.

### Entertainment

A large number of manufacturers and merchants were present and a golf tournament was staged during the afternoons of both days. The winners of the various events were as follows:

Champion Ping Pong Player: Charles Walden, 3rd, Walden, Sons & Mott, Inc.; No. 2 ping pong player, Brad. Garwood, American Lace Paper Company; No. 3 ping pong player, Phil Gates, Gummed Products Company; No. 4 ping pong player, J. L. Littleton, Springfield Paper and Merchandise Company.

Before the awarding of the golf prizes a contest entitled "Is it True or Not?" was staged, this contest being won by Alvin Ostermeyer of the Ostermeyer Paper Company, Indianapolis, the prize being a handsome micrometer contributed by H. J. Schniewind of Testing Machines, Inc., New York.

### The Prize Winners

Before introducing the winners of the various golf events, a booby prize was given to Frank Vaughan of Bay West Paper Company for his golf score, as well as a prize to E. G. Schmidt of International Paper Company for high score. Others winning handsome prizes were as follows:

George Prandy, Bay West Paper .mpany; H. Fralick, International Paper Company; Willard Parker, Columbian Rope Company; Chet Spaulding, Crossett Paper Mills; Ed Hess, Chatfield Paper Corporation; Ed Schlegel, Union Paper and Twine Company; Roth Herrlinger, The Gummed Products Company; Charles C. Walden, Jr., Walden, Sons and Mott, Inc.; George Becker, Hoberg Paper and Fibre Company; Bert Lewis, Nicolet Paper Corporation; Charles Walden, 3rd, Walden, Sons and Mott, Inc.; N. A. Worthington, Menasha Products Company; Maury Peacock, Southern Kraft Corporation; J. W. Stevenson, Northern Paper Mills; Earl Beier, Beier and Company; Brad. Garwood, American Lace Paper Company; Lewis Sisson, Racquette River Paper Company; Bill Hewins, Superior-Lawrence Bag Division of the Sorg Paper Company; Ed Platz, Northern Paper Mills; Clifford Hunt, Osborn Paper Company; J. L. Littleton, Springfield Paper and Merchandise Company; Leo Altholz, Inlander-Steindler Paper Company; R. N. Adair, January and Wood Company; George Davis, Nicolet Paper Corporation; Tony Verschoore, National Paper Company; George Tompkins, Rowland Paper Company; Jack Wittrock, Paragon Paper Company; Jap Downard, Louisville Paper Company; Ross Fife, Gummed Industries Association; George Samson, Samson Paper Co.; G. W. Stidham, Schwarz Paper Company; George Farrow, Hoberg Paper and Fibre Company; Bill Carr, Detroit Sulphite Pulp and Paper Company; Milt Reddy, Northern Paper Mills; W. W. Hinnenthal, Southern Kraft Corporation; Phil Howard, "American Paper Merchant"; Ted French, Crossett Paper Mills; Dave Kennedy, Southern Kraft Corporation; Herb Nichols, Northern Paper Mills; Chester Drury, Security Bag Company; Al Ostermeyer, Ostermeyer Paper Company; Bob Seybold, Seybold

Paper Company; Milan Boex, Northern Paper Mills; John Hrdlicka, National Paper Company; George Sisson, Rasquette River Paper Company; C. Wiese, Northern Paper Mills; Jack Sterling, Rexford Paper Company, and Ed Magel, Crescent Paper Company.

Following the awarding of golf prizes, handsome door prizes were drawn for and won by Charles Meyers of Filer Fibre Company, Bob Ziegler of Menasha Products Company, Harvey Weghorst of Crescent Paper Company, Ray Russell of Marathon Paper Mills, Ohio B. Starks, Jr., of the A. P. W. Paper Company, Pete Bonsor of Bermingham and Prosser Company, and Hugh Blair of Brown-Bridge Mills.

Mrs. Robert Ziegler was presented with a handsome luncheon set in recognition of her service at the meeting in staging the Ping Pong tournament.

## Indianapolis Reports Little Change

INDIANAPOLIS, Ind., June 13, 1938.—Little change was seen this week in the local paper market. Because of much warmer weather there appeared to be some activity in summer specialties, which have lagged for some weeks following a premature spring. Really hot weather found most of the retailers with low or poorly balanced stocks and there was some buying. The tendency was to feel out the situation, however, and no really large orders were reported.

There is some demand for fine papers, but the volume is not what it was a year ago. Even so, prices are being firmly held. The school vacation season has removed this consumer group from the market temporarily. Advertising men say there is some work in prospect, but they are expecting little before late summer.

The week did see, however, some resumption of demand in building and roofing papers. The building volume this year will hardly be as large as last, but considerable work is being started. Distributors have low, but fairly well balanced stocks but are buying only on a hand to mouth basis.

Container manufacturers say there is not much business with the exception of the ice cream trade. This has picked up rapidly in the last week and likely will continue good until fall. Box manufacturers say many of their consumers remain on a part time production basis. There has been a good demand, however, for cases from both breweries and distilleries. Prices are being maintained. There is much casting about on the part of manufacturers for new outlets, but they are meeting with scant success.

Tissues are moving nicely, according to local manufacturers and distributors. Paper stock men here claim there is little mill demand and prices are not satisfactory. At present there is considerable stock warehoused here. Better grade paper and rags seem most in demand.

## Joins Willmann Paper Co.

C. Everett Jacoby and Jack Hermann have joined the sales staff of the Willmann Paper Company, Inc., 530-536 Canal street, New York City. Both men have had a good many years' experience in the paper and printing industry and are widely and favorably known.

## WAUSAW MILLS TO RESUME

*(Continued from page 10)*

Fillmore, Ind. (De Pauw University), and Herbert W. Rowe, Dayton, Ind. (Wabash College).

Two members of the Institute staff, John Strange, secretary, and Howard Morgan, have left for a vacation in Europe. They plan to visit Norway, Sweden, Denmark and Finland.

### Peavy Paper Products Strike Settled

A strike at the Peavy Paper Products Company, Ladysmith, Wis., has been settled, and all employees went back to work Tuesday of last week. A new contract was made which gives recognition to the International Brotherhood of Paper Makers, and the International Brotherhood of Pulp, Sulphite and Paper Mill Workers, both AFL unions. The contract also embodies seniority rights and wage scales commensurate with the average in the industry. The agreement was reached after intercession by E. J. Brophy of Milwaukee, Wis., field examiner for the National Labor Relations Board, and S. N. Moe, Milwaukee, representing the Wisconsin Labor Relations Board.

### Rafts of Pulp Wood Reach Ashland

The first of five rafts of pulp wood to be brought from Canada by the Consolidated Water Power and Paper Company have arrived at the loading hoist at Ashland, Wis. In tow of the tug Butterfield of the Newaygo Tug Line Company, the first raft contained 10,000 cords from the Pic River region. The second will come from Louise Bay, Canada. A crew of 24 men will reload the wood for rail shipment.

Two tugs are also bringing a large raft from Canada to the Marathon Paper Mills Company's mill at Ashland, Wis. The company has already received one shipload of pulp brought by the steamer Lawrendec of Montreal, Canada.

### McLaurin-Hinz Nuptials

Donald J. McLaurin, assistant superintendent of the sulphite department of the Spruce Falls Power and Paper Company, Limited, Kapuskasing, Ont., and Miss Julia Hinz of Appleton, Wis., were married at the bride's home last week. Mr. McLaurin is a graduate of Lawrence College at Appleton. He received his master of science degree in 1937 after graduate work at the University of Washington and the Institute of Paper Chemistry. Mrs. McLaurin was a member of the secretarial staff of the Institute. They are spending their honeymoon at Victoria, B. C., where Mr. McLaurin's parents reside.

## Fairbanks Hand Trucks

In a new catalogue, No. 51, The Fairbanks Company, with general offices at 393 Lafayette street, New York, describe their standard line of hand trucks, platform trucks, casters and wheelbarrows. The company has manufactured trucks for more than fifty years and this catalogue includes only the standard designs used by industrial plants, warehouses, stores, transportation companies, contractors, etc. The company states it will gladly offer their recommendations to inquirers with specific requirements not met in the standard designs.

# CANADIAN NEWSPRINT MILL FORMALLY OPENED

*(Continued from page 9)*

for higher cities and technical sciences. From Comeau Bay must come doctors, lawyers, businessmen and leaders in public and religious life.

"I will anxiously await the day when Comeau Bay will provide a Prime Minister for the Province of Quebec and a Bishop of the Church."

### Distinguished List of Visitors Present

The visitors were taken to Comeau Bay in three river boats. Besides those already mentioned, they included the following members of the Provincial Cabinet: Hon. J. O. Gagnon, Hon. Joseph Bilodeau, Hon. William Tremblay, and Hon. Gilbert Layton.

Among those also present were: Hon. L. A. Giroux, M.L.C.; Dr. A. Leclarc, M.L.A.; Dr. L. Duguay, M.L.A.; Jonathan Robinson, M.L.A.; P. A. Lafleur, M.L.A.; N. J. M. Lockhart, M.P.; A. B. Damude, M.P.; E. J. Anderson, Member of Ontario Legislature; Mayor H. A. Sewell, of Comeau Bay.

J. B. Hunter, Deputy Minister of Public Works, Ottawa; W. C. Cain, Deputy Minister of Lands and Forests, Ontario; Avila Bedard, Deputy Minister of Lands and Forests, Quebec; Major G. H. Shink, comptroller of revenue, Quebec; Louise Coderre, Deputy Minister of Municipal Affairs, Quebec; Edouard Asselin, K.C., Assistant Attorney General, Quebec; J. A. Savoie, general manager, Quebec Liquor Commission; J. Gingras, chairman, Quebec Electricity Commission; Beaudry Leman, president, Banque Canadienne Nationale; S. G. Dobson, general manager, Royal Bank of Canada; George M. McKee, assistant to the president, Consolidated Paper Corporation; Brig.-General J. B. White, vice-president, Canadian International Paper Company; R. P. Kernan, president, Donnacona Paper Company; A. S. McNichols, president, Lake St. John Power and Paper Company; G. H. Duggan, chairman of the board, Dominion Bridge Company; Paul F. Sise, president, Northern Electric Company; F. W. Angus, president, Dominion Bridge Company; R. E. Chadwick, president, Foundation Company of Canada.

R. E. Powell, president, Aluminum Company of Canada; E. Farley, vice-president, American and Hawaiian Steamships; J. H. Price, president of Price Brothers Sales Corporation; A. I. Cunningham, engineer, Aluminum Company of Canada; Arthur Bergeron, Deputy Minister of Roads, Quebec; Colonel C. H. L. Jones, president, Price Brothers; Jean Bruchesi, Assistant Provincial Secretary, Quebec; W. N. Hurlbut, vice-president, International Paper Company; Howard Kennedy, manager, Quebec Forest Industries Association; L. Lemieux, secretary, Canadian Pulp and Paper Association; V. G. Younghusband, vice-president, Foundation Company of Canada; Eugene Potvin, president, Municipal Commission, Quebec; L. A. Langlois, president Quebec Board of Trade; W. B. Scott, manager, Laurentide division, Consolidated Paper Corporation; O. H. Linton, president, Canadian Comstock Company; E. B. McGraw, woodlands manager, Ontario Paper Company; E. C. Larose, assistant woodlands manager, Ontario Paper Company; C. V. Caeser, president, Canadian Forestry Association; J. M. Fairbairn, vice-president, Charles Warnock Company; Charles Bonenfant, private secretary to Premier Duplessis; H. Kieffer, chief of the forest protection service, Quebec; Dr. Jean Gregoire, Deputy Minister, Department of Health, Quebec; Francois Faure, vice-president, Consolidated Paper Corporation.

### Giant Newsprint Plant Erected in Two Years

The new newsprint plant, with its model town, is spoken of as a $30,000,000 enterprise. The whole concern has been constructed in two years, although all supplies had to be transported by ship and the new community literally hacked out of the wilderness. The mill has a capacity of over 100,000 tons of newsprint per year.

### Publisher Visualized Project Years Ago

Colonel Robert R. McCormick visualized the creation of Comeau a number of years ago. He came to Quebec's lonely north shore before the war, and later built a fishing lodge on the shores of English Bay, one of the few white men to establish himself in a district which had never been exploited and little explored, and which was inhabited by Indians, living in much the same manner as their forefathers had lived.

Colonel McCormick first began his development of woodpulp at Shelter Bay on the Rocky River, and Franquelin. The development of these two north shore projects is a story of courage and faith in the country. There were men who went in there to live for years through summer and winter, alone and cut off from civilization. There were set-backs; the break-down of dams and the loss of "log drives." There was the danger of navigation in waters that were uncharted, the regular steamship companies refusing to send their ships into that area for some length of time.

One day Colonel McCormick flew north in the region of the mighty Manicouagan River, near Baie Comeau. In those days—27 years ago—planes were unreliable and pilots flew high to get sufficient gliding altitude in case of engine trouble. On this flight the timber limits of the Manicouagan river were sighted for the first time.

Development of Comeau was postponed by the war and later economic depression. Eventually construction was started on the nearby Riviere des Outardes, a few miles from the Manicouagan, for the development of power and within two years the mill was producing newsprint.

One of the honored guests of the opening of the mill was a dark-skinned Indian from Shelter Bay, Tibasse St. Onge. And no visiting dignitary or official received more attention that that given Tibasse.

For Tibasse, with his flowing white moustache and his old pipe, was with his friend, Colonel Robert R. McCormick, publisher of the Chicago Tribune and founder of Baie Comeau.

The close friendship between the old Indian and the newspaper magnate began 30 years ago, when Colonel McCormick first came to Shelter Bay. Drenched by a heavy rain storm and exhausted from a long trek, the newspaper owner was given shelter by Tibasse and fed hot tea and buns. They struck up an immediate friendship, and it has continued ever since.

## Public Printer Creates New Position

Public Printer A. E. Giegengack has announced the creation of the office of Administrative Assistant to the Public Printer effective as of June 1, 1938. To this new office he appointed Mr. Russell H. Herrell, a member of the Washington Club of Printing House Craftsmen, who, for the past three and a half years, has been the Comptroller of the Government Printing Office.

The Administrative Assistant will be responsible to the Public Printer for the proper handling of all personnel, legal, and purchasing matters, and for the accounting work of the Government Printing Office.

Ever since his appointment as Public Printer of the United States in July 1934, Mr. Giegengack has given considerable attention to the reorganization and proper equipment of the Office, with a view to placing it upon a modern business basis. With this in mind, he has installed new equipment in each of the production divisions of the Office and an entirely new accounting system in the Division of Accounts.

Mr. Herrell, prior to his transfer to the Government Printing Office in November 1934, was with the General Accounting Office for a period of fourteen years, in which office he was engaged in legal, accounting, and administrative work. He is a member of the bar of the District of Columbia.

Capt. Felix E. Cristofane, who succeeds Mr. Herrell as Comptroller of the Government Printing Office, was also with the General Accounting Office. He served in that office as an accountant and an investigator, and at the time of his resignation to accept a position in the Government Printing Office he was the Assistant Director of Finance in the Puerto Rico Reconstruction Administration.

## Increased Movement of Pulpwood

Remarkably enough, under present circumstances, the movement of pulpwood on Canadian railroads continues to show a substantial increase over the figures for this period in 1937. Current figures relating to this movement on the railroads are as follows:

WEEKLY PULPWOOD CARLOADINGS

| | Week of | | To date | |
|---|---|---|---|---|
| | May 21 1938 | May 22 1937 | 1938 | 1937 |
| Eastern | 1,148 | 1,072 | 34,740 | 29,710 |
| Western | 286 | 45 | 12,135 | 4,757 |
| Canada | 1,434 | 1,117 | 46,875 | 34,467 |

PULP AND PAPER CARLOADINGS

| | Week of | | To date | |
|---|---|---|---|---|
| | May 21 1938 | May 22 1937 | 1938 | 1937 |
| Eastern | 1,364 | 2,217 | 32,421 | 50,318 |
| Western | 185 | 437 | 3,886 | 6,425 |
| Canada | 1,549 | 2,654 | 36,307 | 56,743 |

## Col. Edgar Smalley Makes Annual Visit

[FROM OUR REGULAR CORRESPONDENT]

BOSTON, Mass., June 13, 1938 — Col. Edgar Smalley, managing director of Edwin Butterworth & Co., Ltd., Manchester, England, is making his annual visit to the American division of the company, E. Butterworth & Co., Inc. Col. Smalley will be here about a month and will visit other places in this country.

## Farrel-Birmingham Honor Old Employees

On May 23 Farrel-Birmingham Company, Inc., nationally known machinery manufacturers, held its second annual Service Banquet at Ansonia, Conn. Guests of honor were 130 men who have been with the company for a quarter-century or more. Nine of these, who have served Farrel-Birmingham for 50 years or over, were seated at the head table. To 12 men who this year joined the ranks of the 148 with over 25 years' service, handsome Service Pins were presented. John D. Martin, who has just completed 50 years' service, received a gold watch and chain.

Nelson W. Pickering, president of Farrel-Birmingham Company, was toastmaster, and Franklin Farrel, Jr., chairman of the board, presented the awards to the veteran employees. Entertainment was provided during the evening.

The chief speaker of the evening was Louis M. Ruthenburg president of Servel, Inc., who paid eloquent tribute to the loyalty of Farrel-Birmingham's veteran employees and urged them to view industrial relations through the eyes of "logical liberalism."

Mr. Ruthenburg in his address divided the American people into four classifications—die-hard tories, emotional liberals, logical liberals, and extreme radicals or "moochers." The emotional liberals, he said, advocated liberal measures without considering whether such measures were practical or harmful, while the "moochers" comprised the great host whose allegiance could be bought by jobs, political preferment or government subsidy.

On logical liberalism, stated Mr. Ruthenburg, rest the hopes of the nation for a continuation of the American system which has given our workingmen the highest standard of living in the world. He urged his hearers to adopt the spirit of constructive cooperation and fair play for all groups of the population, whether workers, employers or security holders, and called upon them not only to support constructive and generally beneficial social and economic measures but to see that such were attained by sound methods in conformity with the old American traditions.

## English Market for Napkins Expands

[FROM OUR REGULAR CORRESPONDENT]

WASHINGTON, D. C., June 1, 1938—There is a good and growing market in the United Kingdom for paper napkins, coasters, and doilies, which is only partially satisfied by domestic production, according to a report from the office of the American Consulate General, London. While no official statistics are available, it has been reliably estimated that the present imports of these specialties total at least several hundred thousand dollars each year, and it will reach a considerably higher figure. The principal competitors in the market at the present time is a leading domestic concern which has distributors in Africa, Australia and New Zealand, and German, Czechoslovak and Hungarian manufacturers. Both embossed and crepe paper napkins come from Germany, while Czechoslovakia sends only crepe napkins, and Hungary specializes in the embossed product. There appears to be no noteworthy competition from Japan.

# Obituary

### John A. Howard

KALAMAZOO, Mich., June 7, 1938.—John A. Howard, 63, vice president of the Lee Paper Company, Vicksburg, Mich., and traveling representative for the Port Royal Pulp and Paper Company, Limited, died of a heart ailment at his home in Kalamazoo on June 5th.

Mr. Howard was a native of Kalamazoo, the family being prominently identified in social and civic activities for many years. After he was graduated from high school in 1892, he attended Kalamazoo College for two years, then entered the University of Chicago where he was graduated in 1896.

During his early business career Mr. Howard was manager of the Central Phone Company of Kalamazoo and after some years with the Round Oak Stove Company of Dowagiac, Mich., as a traveling representative, he became vice president and general manager of that company. In 1929 he disposed of his interest and returned to Kalamazoo to enter the paper industry in which he was actively engaged at the time of his death. Mr. Howard was a life member of the Klinger Country Club, a charter member of the Park Club and a member of the Kalamazoo Country Club.

Surviving are his widow, a daughter, Mrs. Jane Howard Pease of Ottawa, a son David A. Howard of Chicago and a brother, Harry C. Howard of Kalamazoo.

### Charles B. Wells

[FROM OUR REGULAR CORRESPONDENT]

HOLYOKE, June 8.—Charles B. Wells, 81, of 223 Springfield street, Chicopee, former paper mill executive of Holyoke and Dalton, died late yesterday in his home following a long illness. He was a native of Dummerston, Vt., and came to Chicopee when a boy. He was employed in 1881 by the old Massasoit mill in Holyoke which position he held for 20 years and later went with the Byron Weston company of Dalton where he remained for another 20 years.

He had been alderman and school committeeman of Chicopee and had been active in Masonic circles and was a member of Springfield lodge, the Berkshire Commandery of Knights Templar and Melha Temple of Shriners at Springfield. He is survived by his widow, a daughter and two grandchildren.

### C. M. Salmonsen

[FROM OUR REGULAR CORRESPONDENT]

TONAWANDA, N. Y., June 13, 1938.—Word has reached here of the death at Portland, Me., of Christian M. Salmonsen, 46 years old, former executive of the North Tonawanda branch of the International Paper Company. From 1919 to 1935 he was assistant manager of the Oxford Paper Company, at Rumford, and in 1935 served in a similar capacity, in the Niagara Falls branch of the International Paper Company.

## New Taber Stiffness Gauge

The Taber Instrument Company, North Tonawanda, N. Y., announces the Taber V-5 Stiffness Gauge and Triple-Cut Shear, for the measurement of the stiffness and resilient qualities of paper, coated fabrics, light metallic sheet and wire. The Triple-Cut Shear is an important accessory to the V-5 Gauge as it blanks out test specimens accurate to size, insuring against dimensional errors associated with single shears. Both units are light and portable and can be used anywhere, in the laboratory, office or plant. The gauge's simplicity of operation and quick direct readings make it easy to use, even by those without previous technical experience.

The features of the new gauge include: metric

TABER V-5 STIFFNESS GAUGE

calibration with continuous scale from 0-2000 gram centimeters; advanced design, rugged construction; no delicate parts, electrical contacts or connections; sensitive bearings sealed in lubricant for years of service without further attention. New low price makes it one of the biggest instrument values today. Bulletin 3802 will be mailed on request.

## Elwell-Parker Issues Catalogue

The Elwell-Parker Electric Company, Cleveland, Ohio, has just issued a handy pocket-size booklet of 32 pages, illustrating the leading types and models of Elwell-Parker trucks, tractors and cranes.

Printed on heavy paper in attractive colors, the illustrations show clearly the mechanical details of the various machines. Each illustration is accompanied by a concise set of specifications, including available power. The Elwell-Parker system of industrial transportation is illustrated and explained in detail.

This booklet shows evidence of great care in preparation, so that the reader may find quickly the type of equipment best suited to his needs.

## S. S. Knisely Made 2nd Vice Chairman

SANDUSKY, Ohio, June 13, 1938—S. S. Knisely, mechanical engineer for the Hinde & Dauch Paper Company, was elected second vice chairman of the paper and pulp division of the Ohio Safety Congress during the convention held in Columbus recently.

# Pacific TAPPI and Superintendents Meet at Portland, Ore.

The Pacific Section of the Technical Association of the Pulp and Paper Industry and the Pacific Coast Division of the American Paper and Paper Mill Superintendents Association met jointly in their annual meeting at Portland, Ore., on June 3-4, 1938.

The Friday program was devoted to a golf tournament at the Columbia-Edgewater Country Club. The Ohio Knife Company trophy for the best all-around performance was won by Carl Fahlstrom of the Longview Fibre Company, and the low net prize went to G. H. McGregor of the Weyerhaeuser Timber Company. In the evening there was an informal party and dance under the direction of John E. Hassler.

### Breakfast Meeting Held Saturday

On Saturday morning a breakfast meeting was held. Zana A. Wise was toastmaster. This was followed by business meetings of the two organizations.

In the general program the following papers were presented: "Measurement of Incrustant Material from Cellulose Fibers," by George Schmidt, Pennsylvania Salt Manufacturing Company, Tacoma, Wash.; "The Use of Starch in the Paper Industry," by J. P. Strasser, Stein-Hall Manufacturing Company, Chicago, Ill. A moving picture was shown by the Heller & Merz Company entitled "Beyond the Rainbow."

### Charles W. Boyce Speaks

At the luncheon the speaker was Charles W. Boyce, executive secretary of the American Paper and Pulp Association, New York, who talked on "The American Paper and Pulp Industry."

In the afternoon a discussion was led by Everett Barton of the Pulp Division of the Weyerhaeuser Timber Company on "Past and Present Picture of the Paper Industry."

OFFICERS 1938-1939 PACIFIC COAST SECTION TAPPI

Front Row: W. T. Webster, Vice Chairman; N. W. Coster, Chairman; J. V. B. Cox, Secretary-Treasurer. Back Row: George H. McGregor, Past Chairman—Member of Executive Committee; Carl Fahlstrom, Member Executive Committee

REPRESENTATIVES OF NATIONAL TAPPI

Dr. H. R. Murdock, Vice President; Albert Bankus, Executive Committee; G. S. Brazeau, Executive Committee.

A reception and dinner-dance was held in the evening at which Mr. Boyce and Harold R. Murdock of the Champion Paper and Fibre Company, Canton, N. C. and vice president of the Technical Association were guest speakers. This was followed by a floor show and distribution of prizes.

Kenneth B. Hall of the Improved Paper Machinery Company, Portland, Ore., was general chairman. R. T. Petrie of the Bagley & Sewall Company was in charge of registration; Don Shirley of the Link-Belt Company arranged the golf tournament; Walter Hodges of the Appleton Wire Works, John Hassler of the Coast Manufacturing and Sales Company and Zana A. Wise of the Griffith Rubber Mills, took care of the social activities, banquets, etc. G. H. McGregor is chairman of the Pacific TAPPI and L. S. McCurdy of the National Paper Products Company is chairman of the Superintendents Division.

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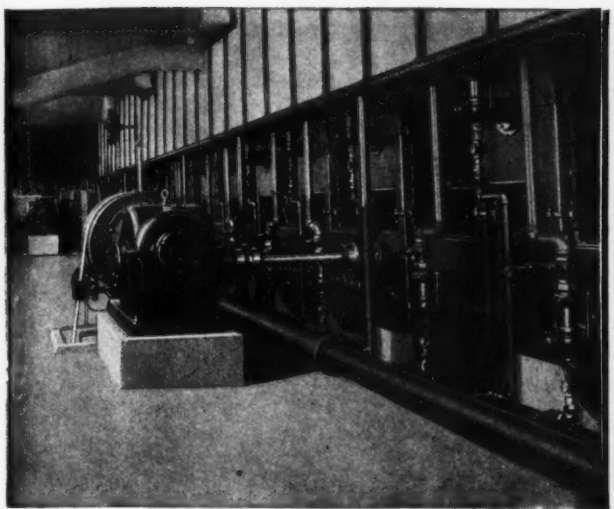
## A New Wax Size

An emulsifying base which spontaneously disperses paraffin wax into a perfectly stable emulsion without the use of a colloid mill or any other complicated machine has been developed for the paper industry by the National Oil Products Company of Harrison, N. J., according to Charles P. Gulick, president.

This new wax size, named Nopco Base Oil 1765, is used for many operations in the paper mill, Mr. Gulick stated. Among those he listed were with rosin as an improved beater size, with starch for tub sizing, run into water boxes on the calendar and blended with coating agents and for the sizing of paper on the alkaline side, a unique development.

Advantages named by Mr. Gulick for this product were improved finish and flexibility, increased sizing without increased brittleness, improved printing qualities due to improved finish, greatly improved quality feel, non-curl or buckle and use of direct dyes in connection with alkaline sizing.

# BELOIT *high-speed* DRYER CONDENSATE REMOVER



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**MAINTAINS MAXIMUM DRYING EFFICIENCY *always***

HERE'S a comparatively new development for dryers that saves tremendously in horse-power and steam by maintaining maximum drying efficiency in the dryers.

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**BELOIT IRON WORKS, Beloit, Wis., U. S. A.**

*The* BELOIT

BELOIT IRON WORKS PAPER MACH'Y BELOIT WIS.

## H. M. Hubbard To Address Convention

Beneath the venerable elms that shade the sward of Harvard University a tall, reticent and wholly retiring young man strolled one June day back in 1928 in an effort to correlate the maze of facts which confronted all men who looked out upon a life of business. Into his mind there crept inklings of what might be done—what could be done—if the right approach were made. He knew then, as many another discovers later, that prosperity rode steadily—not as a runaway vehicle whose speed was determined by the slope of its foundation. It occurred to this young man, fresh from the classrooms of Harvard's Graduate School of Business, that there was a bottom to the rapid pace which then seemed

HOWARD MUNSON HUBBARD

to carry before it all the reasoning and sanity which had characterized the steady growth of American business up to that time. He knew that somewhere along the line there would be a sudden dip, a swerve of the golden chariot, and then a crash. He reasoned that sound business practice, such as he had learned from the country's ablest economists and statisticians, had been thrust aside and that profits were being plucked from neglected sources long before they were ripe.

This man was, and still is, Howard Munson Hubbard, Secretary-Treasurer of the Harris-Seybold-Potter Company and in charge of this company's Seybold Division, manufacturers of paper cutters and trimmers for over forty years.

Because of Howard Hubbard's vision and sound preparation, many opportunities came his way after he left Harvard. Business saw the need for such men. It was ready to accept Hubbard as a link in its chain of stabilizing factors and forestall what they saw to be the unleashing of wild economics. But Hubbard was not ready for business. He was a taught man. First of all he wanted to test what he had learned before putting it into business practice. Harvard University wanted him to teach future business men at Harvard. But Hubbard preferred to go afield—to teach under new influences and with a freer interpretation of what he knew.

Northeastern University at Boston, Mass., had the benefits of Hubbard's keen sense of values as a teacher of differential calculus and higher algebra. During the same period Hubbard taught physics and shop mathematics at Evening Polytechnic. In Bridgeport, Conn., Mr. Hubbard taught Industrial Management at the Evening School of the Y. M. C. A. Again at Katherine Gibbs School in Boston, Howard Hubbard set forth the elements and factors of business Organization to classes during 1927 and 1928.

But business was no longer to escape Hubbard's services. The Royal Baking Powder Company invited Hubbard to draw parallel lines in its production schedules. To fulfill his duties in this sense he was appointed assistant to the Vice-President in Charge of Production. At Royal, Howard Hubbard organized a cost and inventory control, negotiated many major contracts for raw materials and supplies which materially reduced the production costs; negotiated schedules for the entire tartaric acid and cream of tartar industry before the Tariff Commission and subsequently before the Congressional Committee during hearings on the Smoot-Hawley Bill.

In 1930 Mr. Hubbard came to the Harris-Seybold-Potter Company as comptroller. In 1932 he was given the additional duties of secretary, 1936 he was made secretary-treasurer, a position he now occupies with distinction.

Mr. Hubbard is recognized as one of the leading business economists of the country and, during ten years of business activity, has had one of the most spectacular rises in industry.

In addition to Mr. Hubbard's official duties with Harris-Seybold-Potter Company he is also in complete charge of the Seybold Division.

Readers of the PAPER TRADE JOURNAL will have an opportunity to hear Mr. Hubbard address the convention of American Pulp and Paper Mill Superintendents this month at Toronto. His subject will be "The Development of the Art of Trimming Paper."

## Smootharc "Harstain"

The Harnischfeger Corporation of Milwaukee, manufacturer of the P&H - Hansen welder and Smootharc welding electrodes, announces Smootharc "Harstain," an electrode designed for welding such brands of chrome-nickel stainless steel as Enduro, KA-2, Allegheny Metal, Uniloy, Duroloy, etc.

"Harstain's" base metal contains 19 per cent chromium, 9 per cent nickel — a higher content of both elements than in the usual 18-8 type of stainless steel. This prevents nickel and chromium content of the weld from dropping below the analysis of the parent metal. Carbon content of the base wire is below .08 per cent to insure high resistance to corrosion. Columbium is added to prevent carbide precipitation, the cause for inter-granular corrosion.

This coating is especially designed to give the arc maximum stability and protects metal against oxidization or atmospheric contamination. It is accomplished without the use of calcium chloride, a highly toxic chemical found in other stainless steel electrodes. Manufactured in sizes from 3/32 to 1/4 inch in diameter, Smootharc "Harstain" is available in standard lengths of 12 inches. Further information can be obtained by writing the Harnischfeger Corporation of Milwaukee, 4400 W. National avenue.

## Philadelphia Paper Men Have Outing

[FROM OUR REGULAR CORRESPONDENT]

PHILADELPHIA, Pa., June 14, 1938—In a welter of bland sunshine and a truly operatic setting, the Manufacturers Club of Oreland, Pa., was the scene of the annual outing of the Philadelphia Paper and Cordage Association, Inc. on Friday, June 10. There were golf, tennis and quoits for all those who cared to participate, and for those who were in a festive mood, an orchestra furnished music on the spacious veranda of the clubhouse, which is a composite of red geraniums in window boxes. After a strenuous day on the greensward, the members and their guests numbering one hundred and fifty were served with dinner. At the post prandial exercises, Joseph H. Miller of Garrett-Buchanan Company, and president of the Association addressed the gathering, paying tribute to E. K. Lay, chairman of the entertainment committee; Harry S. Platt, chairman of the publicity committee and E. L. Richards, chairman of the golf committee and the members of the respective committees who had worked so untiringly to make the outing the success that it was. During the course of Mr. Miller's address, a telegram was received from James Andrews of Schuylkill Paper Company, who is confined to his home. The telegram expressed all good wishes for a very enjoyable party, and stated that while he (Mr. Andrews) was unable to be with them he was with them in spirit. Frederick I. Brower, vice-president of the Association, sent Mr. Andrews a return wire. Arthur B. Sherrill announced the winners of the prizes, and Miss Mary Schnepp, charming secretary to Mr. Sherrill, presented the awards.

The Schuylkill Cup, symbolic of the association's golf championship, was won by Arthur Brosius of Setterthwaite-Cobaugh Company, who turned in a score of 78, and incidentally puts him in line for the Buffalo Envelope Company's trophy. The cup will remain in the winner's possession for one year, and then will be placed back in competition, becoming the property of a player only after having been won three times. Mr. Brosius was awarded a supplementary prize of a pair of book ends.

The low net score of the day was turned in by Howard Satterthwaite, who shot an 87 with a handicap of 15, giving him a low net score of 72. Mr. Satterthwaite was the recipient of the vice-president's Trophy, a silver water pitcher, donated by Fred Brower, vice-president of the association.

The Kicker's handicap prizes were won by Jack Birle of American Forest Products Company; A. C. Steinberger of Stark Paper and Twine Company, and J. H. Coy of Cherry River Paper Company.

The first prize of the putting contest, consisting of a beautiful desk lamp, was won by J. Howard Bancroft of the Independent Cordage Company. Second Putting prize was won by Doris Lewis, executive secretary of the Philadelphia Paper Trade Association.

In the Quoits Contest, Carroll T. Gardiner, Groveton Paper Company, Groveton, N. H., won first honors with John Heverly of Garrett-Buchanan Company, coming in second and George K. Hooper, president of Hooper Paper and Twine Company, a close third.

Jack Shinners of Acme Specialty Sales Company, and secretary of the association, was the victor in the tennis matches.

Last but by no means least, was the handsome sugar and cream set won by Miss Mary Schnepp.

Notably present was George R. Niswander of Southern Kraft Corporation, New York.

The next regular meeting of the Philadelphia Paper and Cordage Association will be held at Adelphia Hotel, Friday, June 17, when there will be a round table discussion of the future plans of the Association, and final arrangements for the next outing will be announced.

## Cobb-Karapetoff

Friends of Miss R. M. Cobb of Lowe Paper Company were surprised by the announcement last week that her marriage to Professor Vladimir Karapetoff of Cornell University had taken place nearly two years ago, at Dobbs Ferry, N. Y., on November 25, 1936.

Miss Cobb, who retains her professional name, is a graduate of Tufts College and Massachusetts Institute of Technology. She is chemist in charge of the research laboratory at Lowe Paper Company, Ridgefield, N. J., and an active member of TAPPI. Cited recently by the *New York Times* as one of the leading women chemists in the country, her work on the contact angle theory of sizing has won general recognition here and abroad.

Professor Karapetoff was born in St. Petersburg, Russia, and graduated from the Imperial Institute of Ways of Communication and from Darmstadt Polytechnic. He is one of the most prominent engineers of the day, being professor of electrical engineering at Cornell University, consultant to a long list of engineering companies, and also widely known as author, lecturer, and musician.

## A Novel Educational Folder

The National Container Corporation, Long Island City, N. Y., has just issued an unique souvenir folder of considerable general interest and informative value. The various steps in the process of making kraft pulp and board from southern pulp wood at the Jacksonville, Fla., mill of the National Container Corporation, is clearly shown on a sheet of kraft paper 5 feet long by 8½ inches wide. R. H. Laftman is the general manager of the company's kraft, pulp and board division of Jacksonville.

## Novel Addition to Brown Catalogue

A sample swatch showing the entire range of stock lines is a novel addition to the 1938 catalogue of the L. L. Brown Paper Company, Adams, Mass. The swatch, which is affixed to the inside back cover, includes not only the entire range of stock grades, but colors also. It thus presents a comprehensive picture of the line and facilitates quick reference. Copies of the catalogue, which fits a No. 9 envelope, may be had from the company or its distributors.

## R. S. Kellogg To Sail for U. S. June 24

R. S. Kellogg, secretary of the News Print Service Bureau, who, together with Mrs. Kellogg sailed for Europe several weeks ago, has briefly written the editor of the PAPER TRADE JOURNAL that they have been seeing some good paper mills in England, Finland, Sweden, Norway, Germany, France and Holland. Mr. and Mrs. Kellogg will sail for home from London June 24.

# CONSTRUCTION NEWS

***A Summary of Vital Facts Regarding Construction, Financing and Operation of Pulp and Paper Mills***

## General Construction News

**Baltimore, Md.**—The Oles Envelope Corporation, 2510 Lock Raven road, manufacturer of commercial envelopes and kindred paper products, has approved plans for new one-story addition to paper-converting plant, 60 x 140 feet, to be used in part for expansion in storage and distributing division. General erection contract has been let to J. Raymond Gerwig, 22 South Liberty street, Baltimore, and work will be placed under way at once. Cost estimated over $25,000, with equipment.

**Chicago, Ill.**—The Durable Coated Paper Company, 33 South Market street, manufacturer of duplicating papers and other processed paper stocks, plans rebuilding of portion of plant, recently destroyed by fire. The damage was confined largely to the chemical department and is estimated at close to $25,000, with equipment.

**Brooklyn, N. Y.**—The Hano Paper Corporation, 47-04 31st place, Long Island City, New York, manufacturer of paper products, note books and kindred specialties, has leased space in building at 68 Jay street, Brooklyn, totaling about 20,000 square feet of floor space, and will occupy for expansion in storage, distributing and other departments.

**Brooklyn, N. Y.**—In an item regarding William W. Fitzhugh, Inc., in the issue of June 2, it was incorrectly stated that this concern also operated paper-converting plants at New Haven, Conn., and Ridgefield Park, N. J. The firm does operate a plant at Ridgefield Park, N. J., but has not, however, operated a plant in New Haven since January 1, 1938.

**Houston, Tex.**—The Standard Asbestos Manufacturing and Insulating Company, 10 North Olive street, Kansas City, Mo., manufacturer of insulating sheets and kindred materials, has acquired property on Clinton drive, Houston, as site for new factory branch, storage and distributing plant. New Unit will be one-story, 75 x 125 feet, and is estimated to cost over $35,000, with equipment. Work on superstructure is scheduled to begin at early date.

**Mobile, Ala.**—The National Gypsum Company, 190 Delaware avenue, Buffalo, N. Y., manufacturer of wall board and kindred products, has entirely completed its new fiber board mill on 32-acre tract of land on the tidewater at Mobile, previously referred to in these columns, and plant is now ready for regular production of wall board of different sizes and thicknesses, ceiling board and insulating board from wood pulp. Southern pine and hardwoods will be used for raw material and company has arranged for options on extensive tracts of such timber lands in Alabama and Mississippi. Logs are unloaded on a 1200-foot chain conveyor, which carries them to the second floor of the main production mill and discharged directly to the slasher saws. The new plant represents an investment of about $1,000,000 and was built by the H. K. Ferguson Company, Hanna Building, Cleveland, Ohio. Melvin H. Baker is president of company.

**Muskegon, Mich.**—The Central Paper Company, Inc., manufacturer of kraft, tissue and other paper stocks, has received its first cargo of pulpwood to be brought in by water route this season from Nipigon, Ont., totaling about 2000 cords, the material being unloaded at the local wharf of the company. It is expected that an aggregate of 30,000 cords will be secured from the same source for this year's requirements at the mill, considerably more that the amount used last year.

**Lufkin, Tex.**—Plans for the new newsprint mill of the Southland Paper Mills, Inc., Lufkin, lately referred to in these columns, are being completed by George F. Hardy, 305 Broadway, New York, N. Y., engineer, and contracts for buildings and equipment are expected to be awarded at early date. A site for the mill has been selected at Lufkin. It is proposed to construct the plant in four units, with work to begin on first unit in 30 to 60 days and on subsequent units closely following. Each unit will be equipped for a rating of about 50,000 tons of finished stock per annum. Entire plant is estimated to cost close to $7,500,000 and financing is being arranged in that amount through recent RFC loan and sale of stock in new company to private interests. Ernest L. Kurth, head of the Angeline Lumber Company, Lufkin, is president of the Southland company.

**Thorold, Ont.**—The Ontario Paper Company, Ltd., Thorold, manufacturer of newsprint, has completed plans for a barking plant at Heron Bay, near source of pulp wood supply, to consist of drum barking units, log conveyor system, wharf and other plant facilities, as well as a number of houses for employes. General contract for construction has been awarded to A. W. Robertson, Ltd., 57 Bloor street, West, Toronto, Ont., and work will be placed under way at once. Project is estimated to cost in excess of $500,000.

**Svartvik, Sweden**—The Svenska Cellulose A-B., Stockholm, Sweden, operating large mills for the production of wood pulp, has plans maturing for construction of new pulp mill at Svartvik, to specialize

in production of cellulose for the rayon industry. New plant will comprise several large units, with power house, pumping station and other mechanical departments, and is estimated to cost approximately 7,000,000 kroner (about $1,785,000). The mill will be equipped for an initial capacity of about 40,000 tons of high-grade cellulose per annum.

**Berlin, Germany**—Zellstoffabrik Mannheim-Waldhof, G.m.b.H., Berlin, manufacturer of wood pulp for rayon production, has taken over the former Johannes mill at Niederwutzow, and will remodel and equip for new branch mill. Additional structures will be erected and machinery installed for the production of cellulose from native pine, a new use for such wood, the company heretofore using spruce timber, a considerable amount imported, for wood pulp manufacture.

New mill is reported to cost over $350,000, with equipment.

### New Companies

**New York, N. Y.**—The Mutual Blank Book Company, Inc., has been chartered with capital of $5000, to manufacture and deal in commercial paper goods of various kinds. New company is represented by the Excelsior Stationery Company, 116 Nassau street, New York.

**Philadelphia, Pa.**—The Simon Burd Wallpaper Company, 2950 Germantown avenue, has filed notice of organization to deal in wall paper stocks. Company is headed by Simon Burd, 709 South Fifth street, Philadelphia; and Albert Friedman and Nathan Weinstein, both of Camden, N. J.

## Green Bay to be Host to TAPPI

Much interest is being expressed towards the Fall Meeting of the Technical Association of the Pulp and Paper Industry to be held in Green Bay, Wis., September 8, 9 and 10. Green Bay and surrounding Great Lake States area is noted for its importance and prominence as a center of paper manufacturing.

Those attending the Convention will have an opportunity to visit Green Bay mills where tissue and other forms of papers are produced in larger quantities than in any other locality in the world. Visits to nearby mills will also be possible where many other forms and types of papers are produced, such as fine writing and book papers which are made in a large number of mills located within short driving distance of the convention city.

Founded in 1634, Green Bay has been a famous gathering place for travelers and conventions for 304 years. Aside from its concentration of paper manufacturing, Green Bay has many famous historic points of interest. Facilities for sports and recreation will be open to all visitors, including golf on three courses, fishing in numerous streams and the waters of Green Bay. Swimming and yachting, along with many other sports will all be available for visitors to enjoy.

A highlight of the Fall Convention will be the opportunity to attend the season's first National Professional League football game in Green Bay on Sunday, September 11. This game will be between the famous Green Bay Packers and the Rams of Cleveland. Both teams have many widely known All-American and college athletes. In 1929, 1930, 1931 and 1936 the Green Bay Packers were National Champions of the major professional league.

September is Wisconsin's most delightful season of the year. At that time abundant wooded sections around Green Bay will be at the height of their glory. The local committee is expending every effort to make the Fall Green Bay TAPPI meeting one that will be long remembered and this is already a predetermined fact because of the many facilities and points of interest that Green Bay and the surrounding country offers.

A. B. Hansen, vice president and general manager

A. B. HANSEN
Vice President and General Manager, Northern Paper Mills, Green Bay, Wis. General Chairman TAPPI Fall Convention.

of the Northern Paper Mills, is the general chairman of the convention and is preparing an outstanding program.

The local interest in the meeting is made evident by the number of executives who have agreed to serve on the convention advisory committee. These are: John E. Alexander, president, Nekoosa-Edwards Paper Company, Inc.; C. A. Babcock, president, Wisconsin River Paper and Pulp Company; Folke Becker, president, Rhinelander Paper Company; J. N. Bergstrom, president, Bergstrom Paper Company; Charles S. Boyd, president, Appleton Coated Paper Company; D. K. Brown, vice president, Neenah Paper Company; C. B. Clark, president, Riverside Paper Corporation; C. E. Curran, in Charge Pulp and Paper Section, U. S. Forest Products Laboratory; K. S. Dickinson, president, Little Rapids Pulp Company; D. C. Everest, vice president, Marathon Paper Mills Company; G. M. Gilbert, president, Gilbert Paper Company; George W. Mead, president, Consolidated Water Power and Paper Company; E. A. Meyer, president, Badger Paper Mills Inc.; A. W. Miller, vice president, Cornell Wood Products Company; W. A. Munro, president, Flambeau Paper Company; F. J. Sensenbrenner, president, Kimberly-Clark Corporation; Karl E. Stanbury, president, Thilmany Pulp and Paper Company; Westbrook Steele, executive director, Institute of Paper Chemistry; Norman S. Stone, secretary, Mosinee Paper Mills Company; Hugh Strange, secretary, John Strange Paper Company.

# PAPER TRADE JOURNAL

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## COMING EVENTS IN THE PAPER INDUSTRY

TECHNICAL ASSOCIATION OF THE PULP AND PAPER INDUSTRY. Fall meeting, Northland Hotel, Green Bay, Wis., September 8-10.

NEW ENGLAND SECTION. Technical Association of the Pulp and Paper Industry—Third Friday of each month at the Nonotuck Hotel, Holyoke, Mass.

DELAWARE VALLEY SECTION. Technical Association of the Pulp and Paper Industry—Second Friday of each month at the Engineers Club, Philadelphia, Pa.

LAKE STATE SECTION, Technical Association of the Pulp and Paper Industry—Second Tuesday of each month at the Conway Hotel, Appleton, Wis.

KALAMAZOO VALLEY SECTION, Technical Association of the Pulp and Paper Industry—First Thursday of each month at the Park, American Hotel, Kalamazoo, Mich.

AMERICAN PULP AND PAPER MILLS SUPERINTENDENTS ASSOCIATION. Annual meeting, Royal York Hotel, Toronto, Ont., June 22-24.

## GOVERNMENT AND BUSINESS TRENDS

Big business men, little business men and all men and women who are interested in the restoration of industry and trade to a high level are disturbed and puzzled at the trend of government, as well as deeply concerned at the present low level of business activity. It requires no extensive knowledge of political or business economics to analyze the factors underlying the present depression and uncertainty. A brief review of the policies and acts inaugurated by any political party that may be elected to preside over the welfare of the nation, will reveal the great importance of political leadership and policy for the well-being of the country. Government and business are not and never have been separate but act and react upon each other. The prosperity of the coun ry depends upon a strong, equitable policy in government, no less than upon the observance of good business methods in industry. Prosperity for all may be difficult to attain but what the country particularly needs now is good cooperation between the Federal Government and business.

The policy of the Roosevelt Administration has largely failed in the application of its monetary, economic and social theories, because it has attempted and still attempts to legislate radical changes affecting all people within too brief a period of time. Moreover, the acts of this Administration are in themselves hastily written and in endeavoring to "railroad" them through House and Senate opposition has been powerful enough to effect many modifications. These compromising changes in new laws have resulted in hodge-podge legislation which has proved particularly harmful to the normal conduct and progress of industrial and trade enterprises.

The trend of government, as expressed in the addresses of President Roosevelt and as confirmed by the past and present acts of his Administration, is unmistakably for more and more active participation of the Federal Government in industry and trade in the form of supervisory boards or bureaus for the more rigid regulation and control of all industrial, utility, agriculture and all major sources of national wealth. The acts of the Roosevelt Administration support the opinion of T. M. Girdler, president of the American Iron and Steel Institute who, at the recent general meeting of that association in New York, said in part: "There are some who profess faith in the ability of government to spend and to legislate the country into prosperity, but the experience of the recent past as well as the long years of history bear witness to the futility of such faith. There can be no objection on the part of industry to fair and reasonable government regulation. In this complex age, industry needs for its guidance certain rules and regulations by government—but rules that are not subject to constant and upsetting change.

"The part of government in business should be the part of a traffic policeman. It should set up fair and proper regulations and catch those who violate the rules. But when government sets up vast bureaucracies to control industry, to restrict its functions, and to compete with it, the net result is to stifle private enterprise and frighten investors. It is not the wrongdoer alone who suffers. Every one engaged in private enterprise finds himself in the shackles of government control."

The general trend of industrial activity for the current week is approximately 32 per cent lower than for the corresponding period last year. The decline has been continuing slowly for some time. As Mr. Girdler has stated it to be his opinion that the slump was needless and caused by the curb imposed upon industry through policies of the Roosevelt Administration, this opinion was also stated by W. W. Cumberland, economist, in an address at the sixth annual convention of the Edison Electric Institute, held at Atlantic City, N. J., on June 9th. Mr. Cumberland said in part: "There is no longer any doubt about the magnitude of the present depression, and it is essentially the handiwork of government. Economic and financial distortions are largely absent, but reasons why business cannot prosper are obvious. They center around tax burdens out of proportion

to national income, labor legislation and its administration which encourage inefficiency and irresponsibility, competition by government with its own citizens, price-fixing and credit manipulation and replacement of competence and responsibility in business management by government restrictions for political objectives. Not one of these causes of the depression has been remedied or is even in process of solution.

"At the present moment, there is no indication that our population is ready to demand the conditions under which capitalism can function. We regard an increasing national debt as an asset and as a motivating force for business recovery. We consider the currency not as a medium of exchange but as an instrument with which to control prices, regulate employment and mold national industry to some predetermined program; we seek prosperity by destroying wealth. When this curious mechanism of incongruities and fallacies refuses to function, we say that capitalism has failed. In reality, we are only affording convincing proof that there can be no capitalism without capital."

## Newsprint Production Decreases

Production of newsprint in Canada during May 1938 amounted to 207,678 tons and shipments to 193,288 tons, acording to the News Print Service Bureau. Production in the United States was 68,001 tons and shipments 66,197 tons, making a total United States and Canadian news print production of 275,679 tons and shipments of 259,485 tons. During May, 19,989 tons of news print were made in Newfoundland, so that the total North American production for the month amounted to 295,668 tons. Total production in May 1937 was 419,429 tons.

The Canadian mills produced 417,418 tons less in the first five months of 1938 than in the first five months of 1937, which was a decrease of twenty-eight and three tenths per cent. The output in the United States was 62,964 tons or sixteen and one tenth per cent less than in the first five months of 1937, in Newfoundland 36,773 tons or twenty-four and eight tenths per cent less, making a total decrease of 517,155 tons, or twenty-five and seven tenths per cent.

Stocks of news print paper at the end of May were reported at 189,008 tons for Canadian mills and 29,819 tons for United States mills, making a combined total of 218,827 tons compared with 202,633 tons on April 30, 1938.

## Simplified Practice for Boxes

[FROM OUR REGULAR CORRESPONDENT]

WASHINGTON, D. C., June 15, 1938—The Division of Simplified Practice of the National Bureau of Standards has announced that printed copies of Simplified Practice Recommendation R146-38, Corrugated and Solid Fiber Boxes for Canned Fruits and Vegetables, are now available. This schedule, which is a revision of Simplified Practice Recommendation R146-33, is based on arrangement and number of cans in box for the 21 sizes of cans now standard in the canning industry.

## Production Ratio Report

The statistics are based upon paper production reports to the American Paper and Pulp Association:

COMPARATIVE MONTHLY SUMMARIES

| Months | 1938(c) | 1937(c) | 1936 | 1935 | 1934 |
|---|---|---|---|---|---|
| January | 63.9% | 90.3% | 76.1% | 65.8% | ..... |
| February | 68.7% | 90.1% | 77.9% | 70.0% | ..... |
| March | 69.6% | 90.3% | 76.0% | 70.5% | ..... |
| April | 67.9% | 92.1% | 82.3% | 70.0% | ..... |
| May | 68.6% | 90.6% | 81.6% | 69.4% | ..... |
| June | ..... | 87.3% | 80.7% | 72.3% | ..... |
| July | ..... | 81.8% | 77.3% | 64.9% | ..... |
| August | ..... | 82.9% | 81.5% | 70.9% | ..... |
| September | ..... | 78.6% | 80.5% | 71.9% | 58.2% |
| October | ..... | 73.5% | 87.6% | 75.6% | 64.7% |
| November | ..... | 61.9% | 88.0% | 75.3% | 61.7% |
| December | ..... | 54.5% | 85.9% | 71.2% | 59.6% |
| Year Average | ..... | 80.6% | 81.3% | 70.5% | ..... |
| First 22 weeks | 67.6% | 90.4% | 78.9% | 69.0% | ..... |

COMPARATIVE WEEKLY SUMMARIES

| CURRENT WEEKS, 1938 | | CORRESPONDING WEEKS, 1937 | |
|---|---|---|---|
| *April 30 | 70.1% | May 1 | 91.6% |
| *May 7 | 66.4% | May 8 | 89.5% |
| *May 14 | 67.7% | May 15 | 90.9% |
| *May 21 | 69.8% | May 22 | 91.2% |
| *May 28 | 70.9% | May 29 | 90.8% |
| *June 4 | 60.4% | June 5 | 85.3% |

The following statistics show the number of mills reporting by ratio groups:

| | Number of Mills Reporting, Current Weeks | | | | | |
|---|---|---|---|---|---|---|
| Ratio Limits | April 30, 1938 | May 7, 1938 | May 14, 1938 | May 21, 1938 | May 28, 1938 | June 4, 1938 |
| 0% to 50% | 101 | 107 | 96 | 95 | 81 | 97 |
| 51% to 100% | 209 | 201 | 212 | 209 | 217 | 119 |
| Total Mills Reporting | 310 | 308 | 308 | 304 | 298 | 216 |

* Subject to revision until all reports are received.
(c) Basic capacity data have been adjusted to correspond with ratings reported by individual companies.

PAPERBOARD OPERATING RATIOS

According to reports from the National Paperboard Association, per cents of operation, based on "Inch-Hours", were as follows:

| Mos. | 1938 (e) | 1937 (e) | 1936 | 1935 | Mos. | 1938 (e) | 1937 (e) | 1936 | 1935 |
|---|---|---|---|---|---|---|---|---|---|
| Jan. | 55% | 80% | 61% | 61% | July | .... | 67% | 69% | 59% |
| Feb. | 61% | 86% | 67% | 67% | Aug. | .... | 74% | 75% | 65% |
| Mar. | 60% | 87% | 68% | 67% | Sept. | .... | 70% | 76% | 69% |
| Apr. | 57% | 89% | 70% | 61% | Oct. | .... | 66% | 82% | 76% |
| May | .... | 86% | 68% | 61% | Nov. | .... | 56% | 79% | 70% |
| June | .... | 75% | 68% | 65% | Dec. | .... | 46% | 74% | 60% |

Week end. Apr. 30, 1938—59%
Week end. May 7, 1938—57%
Week end. May 14, 1938—56%
Week end. May 21, 1938—58%
Week end. May 28, 1938—60%
Week end. June 4, 1938—48%

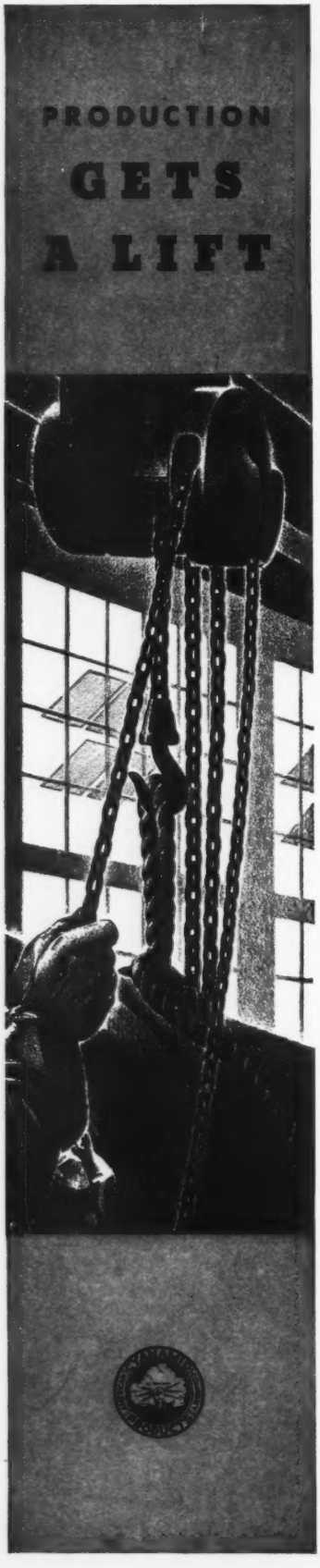
(e) Basic figures revised to include new members of the National Paperboard Assn.

## Government Paper Bids

WASHINGTON, D. C., June 15, 1938—The Government Printing Office has received the following bids for 3,000 pounds of back lining paper for case making machines: Andrews Paper House of York, 3.425 cents; Barton, Duer & Koch Paper Company, 3.24 cents; Mathers-Lamm Paper Company, 3.55 cents; R. P. Andrews Paper Company, 3.72 cents; Mudge Paper Company, 3.6 cents; and Baltimore Paper Company, 3.72 cents.

For 40,000 pounds of 24x36 rope manila paper: R. P. Andrews Paper Company, 15.5 cents; and Mudge Paper Company, 15.5 cents.

For 5,000 pounds (52,000 sheets) of Gobelin antique blue M.F. cover paper 20 x 25: Mudge Paper Company, 7.34 cents; Stanford Paper Company, 7.4 cents and 9.19 cents; Whitaker Paper Company, 7.45 cents; Old Dominion Paper Company, 8.19 cents; Marquette Paper Company, 7.48 cents; R. P. Andrews Paper Company, 7.57 cents; Barton, Duer & Koch Paper Company, 7.4 cents; Paper Corp. of U. S., 8 cents; Mathers-Lamm Paper Company, 8 cents; Walker, Goulard, Plehn Company, 7.43 cents and 9.17 cents.

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Section of the
Technical Association of the Pulp and Paper Industry

Edited by Ronald G. Macdonald, Secretary

# Water Removal from Pulp and Paper*

By T. K. Sherwood,[1] H. S. Gardner,[1] and R. P. Whitney[1]

**Abstract**

*Data are presented on the water removal from pulp and paper, as obtained from the Fourdrinier and press section of a sulphite pulp machine and from a drum drier operating on sulfite bond paper. The results obtained from the plup fourdrinier indicate the distribution of water removal from the various parts of the machine. The effect of temperature on the water removal is discussed.*

*The study of drying as it actually occurs on the paper machine yielded results which compare very closely with laboratory data on the air drying of sulfite pulp sheets. Periods of constant rate and falling rate drying were clearly indicated. Sheet temperature measurements were obtained from which it was calculated that about 80 per cent of the water removal occurs while the sheet is in actual contact with the rolls. It follows that the greater part of the water is transferred from the sheet to the felt, rather than directly to the air, and the importance of the felt in machine drying is discussed.*

Drying is a common operation in the manufacture of various important products of all kinds. The drying process may occur at various stages in the manufacture, but is frequently the final operation in which the product is made ready for sale or for use as a raw material by another industry. Part of the water to be removed may be adsorbed on the solid, part held by capillary forces, and part may be carried mechanically without any appreciable forces of attraction for the solid. In almost all cases of commercial drying the water and solid are theoretically easily separable, and the thermodynamic energy requirement for separation of the two is very small, usually amounting to only a few B.t.u. per lb. of water. There is no reason why the water must be vaporized to separate it from the solid, and drying by vaporization, requiring approximately 1000 B.t.u. per lb. of water, is consequently highly inefficient from the thermodynamic viewpoint. It follows that as much water as possible should be removed by mechanical means before drying by vaporization is resorted to, and this rule is followed on the paper machine. The overall efficiency is fairly good, in that 200 lbs. of water are removed from a stock containing 0.5 per cent pulp by an expenditure of about 3000 B.t.u. from the steam, or 15 B.t.u. per lb. water. The efficiency of removal of the last two pounds, however, is extremely low. Increase in this low efficiency may be obtained eventually by the development of effective and economical means for the further mechanical removal of water, or by the multiple effect use of steam for vaporization, following the common practice in multiple effect evaporators for solutions of salts. The use of economizers is an effective means of recovering heat in the waste air, and so improving the overall thermal efficiency. The value of economizers for this purpose is limited in part by the low temperature of the waste air from which the heat is abstracted. Even more serious is the low coefficient of heat transfer obtainable in heating and cooling air streams, requiring the heat transfer surface to be rather large. Condensation of water vapor from wet air promotes the transfer of heat so that higher rates of heat transfer are obtained when the cooling surface is below the dew point of the air. Economizers are consequently more effective in winter and may not be worth installing in warm climates.

The mechanism of air drying of various solids has been studied extensively in various laboratory investigations. As a wet solid is dried in contact with air under constant drying conditions it is found that the rate of drying remains constant over a considerable period. As drying proceeds a "critical moisture content" is reached after which the rate of drying decreases to zero as the equilibrium or hygroscopic moisture content is approved. In the first or "constant rate" period, vaporization takes place from the water on the surface of the solid in a manner similar to vaporization from an open pan of water. The rate of drying is increased by blowing air over the surface, by increasing the air temperature, or by reducing the air humidity. The temperature of the wet material remains constant at the wet-bulb temperature of the air, since the process is essentially the same as vaporization from the wet wick of the wet-bulb thermometer. If heat is received by radiation or by conduction from a hot object the temperature of the material will be higher than the wet-bulb, and the rate of drying increased.

After the critical moisture content is reached the rate of drying decreases steadily and the temperature of the material rises, approaching the dry-bulb temperature as the last moisture is removed. Fig. 1 shows the instantaneous rate of drying plotted vs. moisture content for a hand-formed sheet of sulfite

* Presented at the meeting of the New England Section of the Technical Association of the Pulp and Paper Industry, Roger Smith Hotel, Holyoke, Mass., Dec. 15, 1937.

[1] Massachusetts Institute of Technology, School of Chemical Engineering Practice, Cambridge, Mass.

pulp 0.27 in. (0.69 cm.) thick. The constant rate and falling rate periods are evident, with the critical point occurring at 60 per cent water, dry basis. This is considerably higher than found in drying of clay and granular materials, for which the critical moisture is usually found to be from 5 to 30 per cent, dry basis. Thermocouples imbedded near the center of the pulp slab indicated the temperature at that point, and allowed the calculation of overall coefficients of heat transfer from air to the interior of slab. These calculated values are also plotted on Fig. 1, as overall heat transfer coefficient vs. moisture content. The coefficient remains constant during the constant rate period, and represents the coefficient of heat transfer for the air film on the surface of the wet pulp. After the critical point is reached the water near the surface begins to be depleted, and vaporization occurs at points within the porous solid structure. Heat to accomplish the vaporization must pass through the surface air film and also through the surface layer of partially dried pulp from which some water has been removed. The overall thermal resistance is increased by the resistance of this surface layer through which the heat must penetrate, and the overall coefficient, being the reciprocal of total resistance, decreases as drying proceeds as indicated by Fig. 1. The importance of this "sub-surface evaporation" depends on the material which is being dried. If the structure is fine with very small capillary openings, there will be a strong tendency for the water to move to the surface being evaporated. If the structure is loose with relatively large passages between the particles or fibres, there will be less tendency for the water to move out to the surface, and sub-surface evaporation occurs, with the necessity of heat transfer through the insulating layer of partially dried material near the surface. It is for this reason that wall-board is so difficult to dry.

Sub-surface evaporation is probably not of great importance in the drying of thin sheets of pulp and paper, where evaporation occurs at or very near the surface of the sheet. This is indicated by data on air drying of one and two thicknesses of news-print, where it was found that the weight of water lost per unit time was the same in both cases. Fig. 2 shows the results of air-drying several samples of hand-made paper formed from sulfite pulp beaten for various lengths of time in a ball mill. The samples weighed approximately 0.012 g./sq.cm. or 74 lbs.

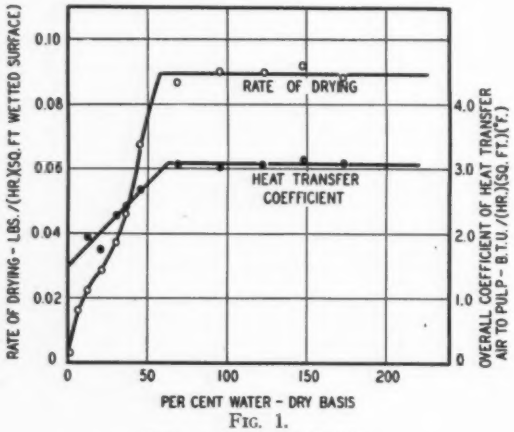



FIG. 1.
Data on air-drying pulp slab.

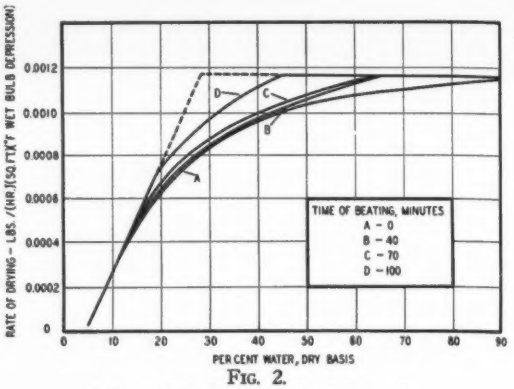



FIG. 2.
Data on air-drying sheets of sulphate pulp.

for 500 sheets 24 in. x 36 in. The unbeaten sheet was soft and porous, and the increased time of beating tended to make the resulting sheet harder and more like parchment. The rate curves obtained vary progressively with time of beating, approaching the dotted curve shown with a sharp critical point at 28 per cent water, dry basis. The differences observed are probably due to the differences in texture, with some sub-surface evaporation occurring in the softer and more porous sheets.

Drying of paper on the usual nest of dryer rolls is similar to the examples cited of ordinary air drying. The effect of heat conduction is accented by the contact with the heated drums so that during the constant rate period the sheet temperature is not only above the wet-bulb temperature of the air but usually above the dry-bulb temperature. Because the equilibrium temperature under such conditions is so much above the inlet temperature of the sheet coming from the wet end, there usually exists an appreciable initial adjustment or preheating period in which the sheet is heated. The critical moisture content is so high that this preheating period may be hardly over before the falling rate period begins, and the constant rate period is sometimes not as evident as would be expected. The sheet is above the wet-bulb temperature of the air at all times, and increased air velocity tends to cool the sheet, this cooling tending to reduce the beneficial effect of air velocity ordinarily obtained in air drying. Water is removed mechanically by the felts and must then be vaporized.

Because drying under the conditions existing on the paper machine is a more complicated process than ordinary air drying, it cannot be expected that the two processes would be exactly comparable. It is of interest, however, to compare test data obtained on drying paper with the mechanism of air drying of paper which has been described briefly. Data have been obtained showing the progressive water removal along a typical paper machine, and may be used for this comparison. Unfortunately, the corresponding information on water removal on the wet end of the paper machine was not obtained, but such data were obtained on a pulp dryer and bring out several interesting points.

### Water Removal from Wet End of Pulp Drier

The machine tested was a sulphite pulp fourdrinier and dryer producing approximately 55 tons per day of dry pulp weighing 0.087 lbs. per sq. ft. The wire speed was 110 ft. per minute. Forty-four four-inch table rolls were followed by five suction boxes, a

vacuum couch roll, a vacuum press roll, a plain press roll, three heating rolls, and a final plain press roll. The vacuum maintained in the suction boxes was 12.6 in. Hg.; in the suction couch roll 14.8 in.; in the felt suction box 6.0 in.; and in the suction press roll 19.9 in. The first two felts had been in use for 10 and 7 days, respectively; the third had been in use for six weeks, and was renewed shortly after the tests were made. The brass wire was 106 in. wide, 30 mesh, and had been in use for one month. Pulp consistencies of samples removed from various points along the wet end were obtained, and the moisture contents expressed as lbs. water per lb. dry pulp. From head box to couch roll samples were removed with a ten inch wooden scoop. Beyond the couch roll the sheet was torn to remove samples.

The curve of Fig. 3 is typical of the results obtained, and shows the trend of moisture concentration with position. For convenience the ordinate scale is logarithmic, with the points representing moisture concentration plotted directly above the corresponding position on the machine as indicated by the diagram at the bottom of the plot.

The per cent of initial water removed by each section of the machine is shown in Table I.

TABLE I
REMOVAL OF WATER ENTERING FOURDRINIER

| | |
|---|---|
| Table rolls | 62.2 |
| Suction boxes (5) | 20.2 |
| Couch roll | 12.4 |
| First press | 2.2 |
| Second press | 0.5 |
| Third press | 0.2 |
| In sheet to dryers | 2.3 |
| | 100.0 |

It is evident that over half of the water is removed on the table rolls, and that each succeeding portion of the machine removes progressively less water. The increasing difficulty of water removal as the sheet is formed is indicated by the fact that the water removal at roll 42 was approximately one sixth of that at roll 7. The action on the table rolls is similar to filtration in that water filters through a pulp layer increasing in thickness as settling takes place. The suction boxes remove over half of the water left in the sheet leaving the table rolls, and the suction couch roll is particularly effective. The press rolls remove successively less water and the sheet goes to the driers containing about 2 lbs. water per lb. pulp, or 33 per cent pulp on the wet basis.

Throughout this section of the machine sheet temperature is an important variable because of its influence on the viscosity and surface tension of the water. The flow of water through the fibrous pulp mat is viscous or stream-line, and the rate of drainage for a given liquid head is inversely proportional to the viscosity of the water. The extent to which drainage will take place, however, depends on the surface tension. If an open capillary tube is placed in a vertical position with the lower end resting in a cup of water, the level in the tube will rise to an equilibrium position dependent on the surface tension and the diameter of the tube. If the water level be forced further up the tube and then released, the drainage back to the equilibrium position is quite analogous to drainage on the wire. The rate of drainage depends on the viscosity, but the final level reached depends on the surface tension. The equilibrium position of water in the sheet is not reached on the table rolls or on the suction boxes because the removal of a relatively small amount of water would not justify the additional equipment necessary.

During summer operation with comparatively warm water, both viscosity and surface tension are low enough so that drainage on the wire is not usually a problem. With colder water in the winter, however, it may be necessary to take steps to increase the temperature of the stock on the wire. This may be accomplished by the use of warm water in furnishing the stock to the machine, or by the use of steam showers beneath the wire. Interest is now being shown in relatively inexpensive countercurrent towers which use warm air discharged from the drying actions of pulp and paper machines to heat large quantities of fresh water that may be used to furnish stock to the machines. The use of heating rolls to raise the temperature of the sheet before the third press rolls (see Fig. 3) illustrates another application of the use of heat to increase water removal from the wet end.

### Machine Drying of Paper

The paper machine dryer studied was of the conventional type, having twenty-eight rolls each four

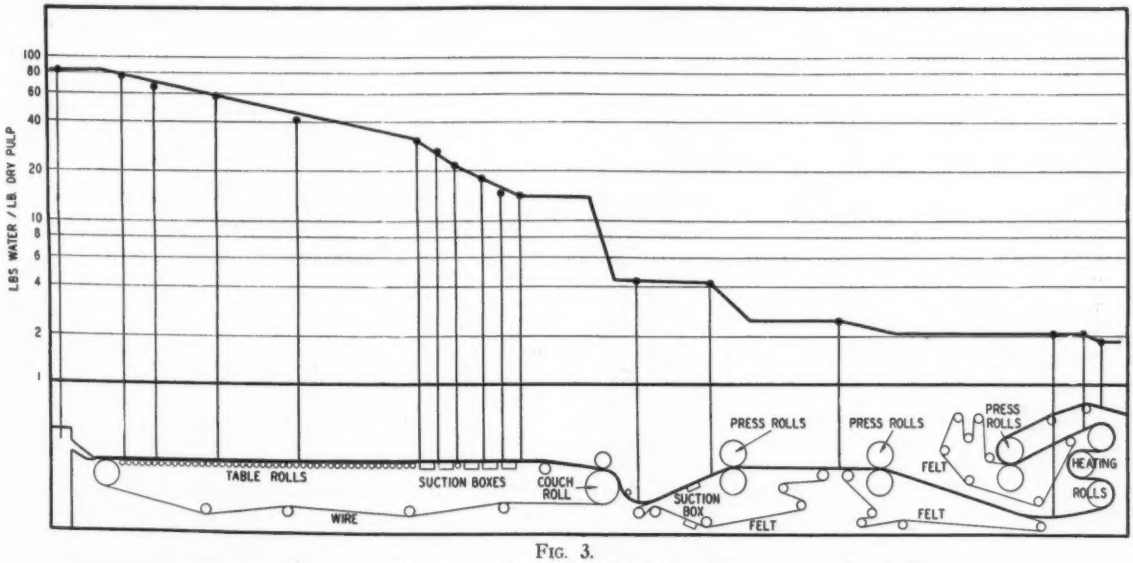



FIG. 3.
Water removal from wet end of pulp machine.

feet in diameter in the long nest and one two-foot roll and six four-foot rolls in the short nest following the size bath. The rolls were mounted in two rows, one above the other. The sheet was held against the rolls by canvas felts, except on the small roll. The long nest contained two top and two bottom felts, with the front bottom felt on odd numbered rolls from 1 through 13, and the rear bottom felt on odd rolls 15 through 27. The front top felt covered even rolls 2 through 14, with the rear top felt on rolls 16 through 28. Separate canvas felts were used on the top rolls (31, 33, 35), and the bottom rolls (30, 32, 34,) of the short nest.

Steam was supplied to the long nest through an automatically controlled diaphragm valve regulated by the temperature within a dryer drum and by the tension developed by the shrinkage of the sheet. Steam on the short nest was controlled by a reducing valve loaded by a weight. Condensate was removed from the drums by a Cram condensate removal system, consisting of a siphon pipe carrying a graduated orifice, reaching to the bottom of each drum.

Air circulation was provided by exhaust fans in the machine room roof above the dryer, and by a ventilating system which blew air heated to about 130°F. against the bottom surface of the bottom felt and the top surface of the top felt, as they returned from the center of the long nest to the wet end of the dryer. The major portion of this air was blown against the bottom felt, although some was also blown through ducts into the sides of the dryer, at points where the sheet passed from the rolls. Although the air from this ventilating system amounted to 12,000 cubic feet per minute, it cannot be considered as a major factor in controlling the drying process, since it contributed only about 25 per cent of the total air flow associated with the drier.

To study the drying operation, test procedure included measurements of the moisture content of samples from various parts of the machine, rate of paper production, condensate rate, steam pressure in dryer drums, and temperatures of the sheet entering and leaving each roll. Condensate rate was measured by discharging all condensate from the drier into a calibrated drum.

Samples of paper for moisture determinations were torn from the sheet, placed immediately in cans with tight friction tops, and subsequently analyzed for moisture content by drying in the cans in a laboratory oven. Total change in moisture was determined from samples about one foot square taken periodically during the test run from the edge of the sheet, at the wet and dry ends of the long nest and at the wet end

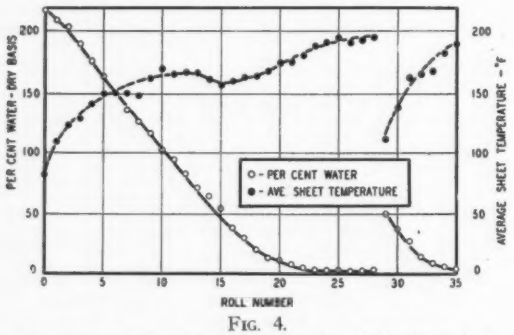



FIG. 4.

**Water removal and sheet temperatures for sulphite bond sheet in paper drier.**

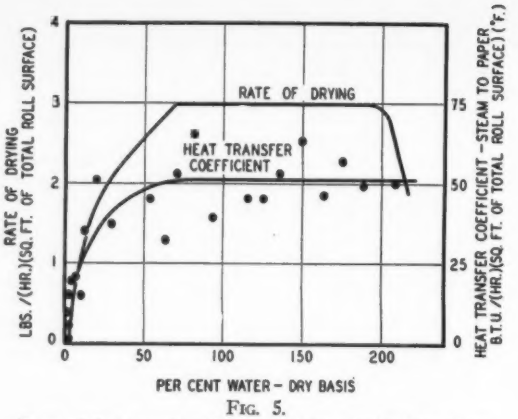



FIG. 5.

**Rates of drying and coefficients of heat transfer from steam to sheet on paper drier.**

of the short nest. These analyses were corrected to the average moisture content across the width of the sheet by means of samples taken at the beginning and at the end of the test from each edge and the center. The moisture content of the sheet entering the drier varied from 209 to 218 per cent, dry basis, and the ratio of average moisture to moisture of the edge samples was 0.97 at the wet ends of both nests. The moisture content of the finished paper was determined from samples cut from the full width of the sheet. For a study of the rate of drying, samples were taken from the sheet after each dryer roll. Working rapidly from the dry to the wet end, a complete set of samples was obtained in about five minutes.

Sheet temperatures were measured by means of a specially constructed copper-constantan thermocouple, consisting of a hot junction silver soldered to the back of a thin brass strip, mounted in a case so that the strip could be held against the moving surface with a slight, uniform pressure. Although it is recognized that errors were introduced in the temperature measurements by heat due to friction and by heat losses from the thermocouple to the brass case and to the surroundings, it is believed that the temperature level indicated by the instrument is probably correct to within 10 deg. F., and that temperature differences, as indicated by the instrument, are correct to within 3 deg.

Significant data and results from a three hour test run are presented in the following Table II.

TABLE II
DATA AND RESULTS OF TEST ON PAPER MACHINE DRIER

| | | | |
|---|---|---|---|
| **Paper** | | | |
| Grade ..... No. | 1 | | Sulfite Bond |
| Base weight, 500 sheets, 24" x 36" (lb.) ..... | 46 | | |
| Width of sheet (inches) ..... | 89 | | |
| Machine Speed (ft./min.) ..... | 366 | | |
| Paper Produced (lb. dry paper/hr.) ..... | 2360 | | |
| Total Evaporation (lb./hr.) ..... | 5900 | | |
| Pressure of Steam in Long Nest (lb./sq. in. gage). | 2.5 | | |
| | Dryer Rolls | Air Heater | Total |
| Steam Consumption (lb./hr.) ..... | 7340 | 680 | 8020 |
| Lb. steam/lb. dry paper ..... | 3.11 | 0.29 | 3.40 |
| Lbs. water evaporated/lb. steam ..... | 0.80 | ... | 0.74 |
| B.t.u. from steam/lb. water evaporated.. | 1230 | ... | 1340 |

These results are in good agreement with those of a run made six months previously on this same drier, and they also agree with results of tests made at the same time on a similar drier operating under comparable conditions.

The changes in moisture content and sheet temperature on passing through the drier are indicated by Fig. 4. Minor variations in the mosture content, causing the data to deviate from a smooth curve

through the points, can be correlated, particularly at rolls 13 through 16, with variations in sheet temperature. The data indicate that the last five rolls of the long nest represent excess capacity for drying under the test conditions, since there is no significant drying after roll 23. It would have been possible to have handled a higher rate of production on the long nest, or to have dried the paper at the existing rate of production at a lower temperature. The short nest appears to have been operating closer to its capacity with a more evenly distributed drying load, since there was an appreciable reduction in water content down to the last roll.

The curve showing the rate of drying in the long nest of the paper machine, Fig. 5, is derived from the curve of moisture content vs. roll number, Fig. 4. The rate of drying curve presented for machine drying of bond paper may be regarded as typical for this operation, since the shape of the curve was duplicated by data from three other sets of samples, one from this same machine, and two from a similar machine.

The shape of the rate curve agrees well with those of Figs. 1 and 2 for air-drying. As the sheet enters the drier, there is a period of intial heating, with the drying rate increasing rapidly as the temperature rises. A period of constant drying is soon reached, where surface evaporation is controlling. In this period, the sheet temperature becomes relatively constant, and water is being supplied to the surface from the interior of the sheet as rapidly as it is being removed. About halfway through the drier, at roll 14, the sheet reaches a critical moisture content, approximately 70 per cent water, on the dry basis. From this point on, the rate of drying steadily decreases, and the sheet temperature rises. Since the sheet was thin (0.004 inches), it is probable that the mechanism in the falling rate period is one of unsaturated surface drying, rather than sub-surface evaporation. In this case, drying is still a process of evaporation from the surface, but the rate decreases because the surface is not completely wet. The location of the critical moisture content, dividing the periods of constant and falling rate drying, marks the transition from saturated to unsaturated surface drying.

The shape of the drying rate curve in the falling rate period is subject to variation, depending on the selection of the best curve through the experimental points of moisture content vs. roll number, Fig. 4. However, the curve for the falling rate period as derived for Fig. 5 is of the same general shape as the curves of Fig. 2 for the air drying of similar sheets. Similar curves have been obtained in laboratory studies of drying by McCready (1) for thin pulp sheets and for newsprint by Sherwood (4).

The critical moisture content of about 70 per cent, dry basis, agrees reasonably with critical moisture contents of about 60 per cent for thin sheets, as indicated by Sherwood's data, and as recommended by McCready as a basis for calculations. Drying rate curves prepared from data on the short nests of the driers tested are similar in shape to the curves for the drying rate in the long nests, over a range of corresponding moisture contents.

Overall coefficients of heat transfer from steam to paper were calculated for each roll of the long nest. The heat transferred was calculated as that necessary to evaporate the water removed from the sheet between sampling points after each roll, and to bring about the change in sensible heat indicated by temperature measurements at the sampling points. The temperature driving force was taken as the difference between the saturation temperature corresponding to the steam pressure and the average of the two sheet temperatures taken as the sheet entered and left the roll. The coefficients were based on the total roll surface, calculated from the roll diameter and width covered by the sheet. Individual values of the heat transfer coefficient are shown in Fig. 5. Variations in these values result from fluctuations in the original data of moisture content and sheet temperature on which the coefficients are based. The heat transfer coefficient tends to remain constant at a maximum value during the period of constant rate drying, and then decreases as the paper passes through the falling rate period. There is the possibility of considerable error in these coefficients. Any heat received by the felt from the sheet is not accounted for as heat transferred, so that the coefficient will tend to be low, on this account. It is also probable that some liquid water may have been transferred from the sheet to the felt, and in this case, the coefficient would be high. While these two errors in opposite directions might be compensating, it is difficult to estimate the magnitude of the resultant error. The coefficients can best be considered for their qualitative significance.

Although there have been numerous publications of laboratory data concerning the drying of pulp and paper, there is little information available regarding actual machine drying. It is therefore appropriate to point out that these data indicate good agreement between actual plant operations and the laboratory studies. The periods of drying at constant rate following by drying at a falling rate, so characteristic of laboratory drying under constant conditions, have been clearly identified in actual machine drying of paper, where drying conditions are far from constant.

### Mechanism of Water Removal in Machine Drying

Since the drying rate curve indicates that surface evaporation is the controlling factor in the removal of water in machine drying, it is of interest to consider the mechanism by which surface evaporation may take place. In its course through the drier, the sheet surface, on a given side, comes into alternate contact with a hot metal surface on one roll and the surface of a drier felt pressing the sheet against the next roll. Between rolls, both sides of the sheet are exposed to the air. From measurements in the long nest of the drier tested, 83 per cent of the total length of the sheet was in contact with the rolls. While on the rolls, 61 per cent of the total sheet length was covered by the felt. The sheet surface exposed to the air, at any one time, may be calculated as $100-0.5(83+61)=28$ per cent of the total surface. Since no evaporation takes place from a surface in contact with a roll, there remains to be considered the possibilities of water removal from the surfaces covered by the felt or exposed to the air.

The importance of the felt in the operation of a dryer has long been recognized by paper makers, but relatively few data are available to indicate its part in the drying process. McCready (2) found that when a plup slab, covered by a canvas drier felt, was rided on a heated metal surface, the rate of constant rate drying was about half its normal value in the absence of the felt. Mull (3) has made an extensive

laboratory study of drier felts of various types, and through model studies, has shown that they have a marked effect on the removal of moisture during the drying of paper.

During the test on the paper machine drier, data were obtained which permit an estimate of the relative amounts of water removed when the sheet is covered by the felt and exposed to the air. Since there is no heat input to the sheet between rolls, a drop in temperature of the sheet between rolls can be accounted for only by external cooling of the sheet by convection and radiation, or by evaporation of water from the sheet accompanied by cooling due to the removal of latent heat. The effect of external cooling of the sheet is most pronounced at the dry end, where the sheet has a low heat capacity (0.3 B.t.u./lb./°F.), and here there was an average drop of 5°F. between each pair of the last four rolls of the long nest. This cooling takes place with very little evaporation of water, since the sheet is practically dry. It is assumed that the heat effect of external cooling is constant throughout the drier. At the wet end, where the heat capacity of the wet sheet would be about 2.5 B.t.u./lb. paper/°F., the drop due to external cooling would be 0.6°F., or even less because the cooler wet sheet is nearer to the temperature of its surroundings. Since the drop in temperature of the sheet between rolls average 9°F., it is evident that almost all of the cooling of the sheet was due to evaporation of moisture. The calculation of the amount of moisture evaporated from the sheet into the air between rolls, as compared with the moisture removal while the sheet was on the roll, based on data for roll No. 5, is as follows:

DATA:
Sheet temperature leaving roll No. 5—152° F.
Sheet temperature entering roll No. 6—141° F.
Moisture content entering roll No. 5—1.76 lbs. water/lb. dry paper.
Moisture content entering roll No. 6—1.64 lbs. water/lb. dry paper.
Specific heat of dry paper—0.3 B.t.u./lb./° F.

CALCULATION:
It is assumed that the effect of external cooling by convection and radiation is constant at 0.3 x 5 = 1.5 B.t.u./lb. paper, as indicated by the temperature drops between the last four rolls of the long next.
Heat capacity of sheet entering roll No. 6 = 1.64 + 0.3 = 1.94 B.t.u./(lb. paper) (° F.)

$$\text{Temp. drop due to external cooling} = \frac{1.5}{1.94} = 1° \text{ F.}$$

Temp. drop due to evaporation between rolls No. 5 and No. 6 = (152—141)—1 = 10° F.
Let x = lbs. water evaporated between rolls/lb. paper.
1.64 + x = lbs. water/lb. paper leaving roll No. 5.
Latent heat of vaporization at 152° F. = 1007 B.t.u./lb.
Writing a heat balance, based on one lb. of paper.
Latent heat of water exaporated = (Change in sensible heat in sheet from roll No. 6 to No. 6) — (effect of external cooling) 1007x = (0.3 + 1.64 + x) 152 — (0.3 + 1.64) 141 — (0.3 + 1.64) 1 x = 0.020 lb. water evap. between rolls/lb. paper
Total change in moisture for roll No. 5 = 1.76 — 1.64 = 0.12 lbs./lb. paper.

$$\text{Per cent moisture evaporated between rolls} = \frac{0.020}{0.12} \times 100 = 17\%.$$

Per cent moisture removed on the roll = 100—17 = 83%.

Calculations similar to those outlined above, applied to each of the rolls in the dryer on which significant drying took place, indicate that about 80 per cent of the drying took place while the sheet was on the rolls. Since it was not always possible to measure the full drop in temperature between two rolls, this value may be somewhat higher than the true figure. However, it seems definite from these temperature measurements, that the major part of the water removal takes place while the sheet is on the drier roll.

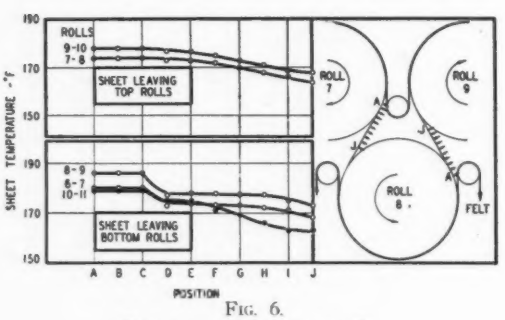



FIG. 6.
Sheet temperatures between rolls.

Since the sheet is covered by the felt for 74 per cent of the time it is on the drier roll, any theory of water removal on the roll must consider the part of the felt in the process. The calculations described have indicated that moisture may be removed through the felt. However, there is the possibility that the felt may act as an insulating blanket, causing the sheet to be heated by the roll and then permitting a sudden vaporization of water as the sheet passes out from under the felt, while the sheet is still on the roll. If this occurs there should be a sudden and marked cooling of the sheet in this region. While sheet temperature measurement covered the major span of the sheet between rolls, there is the possibility that the sudden evaporation as the sheet left the roll might not have been detected. In this case, the measured drop in sheet temperature would be too low, and the calculation of the moisture removed on the roll would be correspondingly high. To investigate this point a study was made of the temperature gradient as the sheet emerged from under the felt and left the roll. The data presented in Figure 6 showing the change in sheet temperature as the sheet leaves the roll were obtained from a different drier than the one which has been discussed up to this point. However, the driers were similar in significant characteristics, so that the data may be considered to be typical of the operation on either one. There was no forced air circulation at the points where these temperatures were measured. Points A, B, and C represent temperatures at points where one side of the sheet is still in contact with the roll. At subsequent points, both sides of the sheet are exposed to the air. The horizontal portion of the temperature curves of Fig. 6 while the sheet is still on the roll indicates that there has been no sudden evaporation of water as the sheet emerged from under the felt. It, therefore, seems probable that the calculated value of 20 per cent of total evaporation occurring between rolls is approximately correct.

Since the temperature drops gradually after leaving the top rolls, there is no sudden evaporation as the sheet leaves contact at this point. However, there is clearly a period of rapid evaporation as the sheet leaves the bottom rolls, as indicated by the drop in temperature between points C and D. The marked difference between the temperature curves for the sheet leaving the top and bottom rolls may be explained by pointing out the differences in the atmospheres into which the sheet emerges from the upper and lower rolls. The upper roll and the felt tend to form a vapor pocket, in which water vapor will tend to reach a high concentration, since its density is less than that of air. Similarly, because of the lower density of hot gases, this pocket will tend to have a relatively high temperature, and thus permit a high partial pressure of water vapor before the saturation point is approached. Since the water removal on the machine has been shown to be controlled by surface evaporation, the humidity of the air in contact with the sheet will have a controlling influence on the rate

of evaporation. Emerging from under the felt on the top roll into a region of high humidity, the sheet will not lose water rapidly until it descends out of the pocket into a region of lower humidity. Applying the same reasoning, it is evident that the sheet emerges from the bottom roll directly into a region of low humidity, giving a high initial rate of evaporation.

During this study of the change in sheet temperatures, a number of felt temperatures were measured, sufficient to indicate that the felt returns from the dry to the wet end of the machine at a temperature considerably above that at which the sheet enters the drier. The felt is therefore a source of heat input to the first few rolls. As the sheet and felt proceed through the drier, the sheet increases in temperature more rapidly than the felt, so that it assumes a temperature between those of the felt and the roll. The felt is gradually heated, and also dried, as it approaches the dry end. From here, it returns warm and dry to the wet end of the drier, cooling slightly from its contact with air on the return to the wet end.

It has been shown that only the smaller part of the water removed from the sheet during machine drying is evaporated from the surfaces exposed to air between the rolls. It follows that the major water removal must take place while the paper is on the rolls and covered by the felt. The importance of the felt as a factor in the drying process should therefore be clearly recognized. Since the felt, rather than the air, is in contact with the drying surface during the process of water removal, the felt can be regarded as providing the "atmosphere" into which the water from the sheet must diffuse. It is probable that some of the moisture is transferred from the sheet to the felt as liquid water, while of the moisture transferred as vapor, some passes directly through the felt, and the rest is condensed in the felt. As the felt increases in moisture content, particularly at the surface in contact with the sheet, it will retard the rate of drying, since its effect is to expose the drying surface to a region of higher humidity. The rate at which one can dry paper is therefore likely to depend, in many cases, upon the minimum moisture content which a machine can maintain in its felts.

From this consideration, it is apparent that the period of constant rate drying on a paper machine represents a balance between the effect of heat input from the felt at the wet end, increasing sheet temperature, and increasing moisture content of the felt. The falling rate period may have its inception from several causes, either the reaching of the critical moisture content of the sheet, or from an increasing moisture content of the felt which makes it impossible to maintain the constant rate of water removal from the sheet.

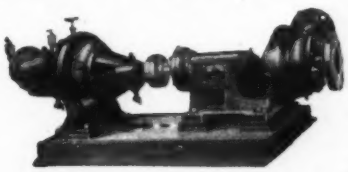
The authors wish to acknowledge the efforts of students at the Bangor Field Station of the M.I.T. School of Chemical Engineering Practice, who conducted the experimental work of the machine tests and who contributed to the interpretation of the data. The test on water removal from the wet end of a pulp machine was under the direction of Mr. Charles M. Cooper, formerly Director of the Bangor Field Station.

### Literature Citations

(1) McCready; Paper Trade Journal, *101*, 160 (1935).
(2) McCready; Paper Trade Journal, 101, 167 (1935).
(3) Mull; Papier Fabrikant, *30*, 701, 725, 737, 749 (1932).
(4) Sherwood; Ind. & Eng. Chem., 22, 135 (1930); *21*, 979 (1929).

## End Suction Centrifugal Pumps

The Ingersoll-Rand end suction centrifugal pump, style CRV, built in capacities up to 1,000 gallons per minute for heads up to 500 feet, is the subject of a new bulletin released by Ingersoll-Rand.



This pump offers single or two stage construction, open or closed impeller, and a variety of drives including electric motor, steam turbine, gasoline engine or belt. The use of the open impeller in conjunction with a hand hole suction piece has proved invaluable in food plants and paper mills where heavy liquids are handled. The CRV pump has found wide application in many industries because of its high efficiency, low price and strong sturdy construction. Some of the liquids it has been used to pump include water, gasoline, fuel oil, caustic soda, quenching oil, phosphate liquid, brine, ammonia, fruit juice, starch, white water, naphtha, benzine, alcohol, alum, molasses, sugar liquor, paste paper stock, etc.

Pictures of several of these installations, as well as complete tables of performances and dimensions, with explanations for selection of the proper size pump are contained in the bulletin, number 7069, copies of which may be obtained from Ingersoll-Rand Company, Cameron Pump Division, 11 Broadway, New York City, or any of the company's branch offices.

## Unemployed Paper Employees

[FROM OUR REGULAR CORRESPONDENT]

WASHINGTON, D. C., June 15, 1938—Final figures for the unemployed census have just been made public by John D. Biggers, the administrator of the national unemployment census.

These figures show that in the paper and allied industries the registrants of unemployed, including emergency workers, totalled 21,139, of whom 16,156 were males and 4,983 females. Also 17,536 registered as totally unemployed, of whom 12,875 were males and 4,661 were females. Also 3,603 registered as emergency workers, of whom 3,281 were males and 322 females.

In connection with the census, figures are shown for gainful workers in 1930 in the paper and allied industries with a total of 243,389 of whom 191,980 were males and 51,409 were females.

## W. A. "Spike" Kelly in Accident

Friends of "Spike" Kelly, of E. D. Jones & Sons Company, Pittsfield, Mass., will be concerned to learn he has been in an automobile accident resulting in a broken thigh, four broken ribs, a broken nose and cuts and bruises.

Mr. Kelly informs us that any of his friends driving South should be warned against cattle and stock on the highways which was the cause of his car being smashed.

"Spike" will be happy to hear from any of his friends at the Mack Wilson Hospital at Monticello, Ark., where he will be for the next few weeks.

# The Potentialities of Enzymes in the Paper Industry*

By R. A. Diehm [1]

Enzymes have been used in paper making processes for a comparatively short time. An enzyme is still considered a new tool in the hands of many papermakers, but, in general, processes involving enzymic reactions are becoming almost universally accepted. In attempting to measure the potentialities of enzymes in the paper industry, it is necessary to take into account what purposes have been served by enzymes and what other purposes might be served by still different enzymes.

Enzymes may be defined as biological catalysts which carry out chemical reactions essential to life processes. They are organic in nature and are produced by living organisms. They can be separated from the living forms and used to carry out chemical reactions in vitro. It is this property which makes their commercial use possible. In order to overcome certain misconceptions, it is necessary to emphasize the fact that enzymes are not living microorganisms but are definite organic complexes of lifeless nature. Their ability to accomplish difficult chemical reactions at moderate temperatures makes enzymes of tremendous importance commercially.

## Enzyme Reactions

Enzymes are highly specific in the reactions which they carry out. A starch splitting enzyme will hydrolyze starch, but will not attack proteins. In a like manner, a protein splitting enzyme will hydrolyze proteins, but will not attack starch. There is nothing that we can do to change these inherent characteristics. It is quite obvious, therefore, that a properly selected enzyme will give the desired results in commercial processes. Many attempts to utilize enzymes have failed because the enzyme chosen was not of the proper type and could not give the expected results.

Other important features of reactions catalyzed by enzymes are the mildness of the reaction and the flexibility of the process. Enzymes differ from inorganic hydrolyzing agents in both their selectivity and their ability to react with products found in the intermediate and the final stages of hydrolysis. For example, certain types of starch splitting enzymes will hydrolyze starch to the dextrin stage, but will not proceed any further while mineral acids will hydrolyze starch to dextrins, then break down the dextrins into sugars and finally act upon the sugars themselves. Since the action of the enzyme is so extremely selective and yet so mild, the action can be stopped at almost any desired place, making it possible to adapt the enzyme over a wide range of usefulness.

It is to be clearly understood that this discussion does not pertain to any particular types of enzymes now on the market. It treats enzymes from a technical standpoint in an endeavor to show their potentialities. It is most likely that some of you will not agree to some of the applications which will be referred to in this discussion. If so, you might not have worked with the proper types of enzymes or perhaps some factor influencing the reaction was overlooked. It is not to be inferred that enzymes are a cure-all for all the paper-maker's troubles, but it is a noteworthy fact that they can be or are being used in the processes to be discussed.

## Types of Enzymes

The starch-splitting enzymes are the best understood in the paper industry. They are properly called "amylolytic" enzymes and are sometimes referred to as "amylases" and "diastases." They are characterized by their ability to hydrolyze starches. Animal and plant tissues are natural sources of amylolytic enzymes. We have not been able to change the nature of these natural enzymes, but have only succeeded in changing their speed of reaction and a few responses to external stimuli. This characteristic is without doubt due to the fact that the biochemical processes of life in the higher animals and higher plants cannot be modified to any great extent without destroying life itself. Hence the constant nature of the enzymes which carry out the essential biochemical reactions.

The amylolytic enzyme is not a simple substance. Dr. Waldschmidt-Leitz has divided a certain amylolytic enzyme into alpha-amylase, beta-amylase and amylo-phosphatase. These components were separated by adsorption on kaolinite, bauxite, etc. These components as such are inaction and cannot catalyze starch hydrolysis. As to chemical composition they are either proteins per se or proteins which carry specific reactive groups. They are activated by a substance known as amylokinase. The chemical nature of amylokinase is not unlike that of certain split-products of protein hydrolysis.

## Starch Hydrolysis

What is the mechanism of starch hydrolysis by means of amylolytic enzymes? It is necessary to give some regard to the union between the enzyme and the starch molecule to even approximate an answer to this question. It is also necessary to form a conception of the chemical constitution of the starch molecule to build up a workable hypothesis.

There must be a union of the enzyme and the starch, i.e., the formation of a starch-enzyme complex. This union does not complete the catalytic action. It is quite probable that the diastase is combined to the starch molecule at more than one point of linkage. The catalytic action is completed when the starch-enzyme complex is decomposed, setting free the enzyme and the split-products of starch hydrolysis. It is not known how often the enzyme "molecule" can go thru this routine before it loses its power to catalyze starch hydrolysis.

* Presented at the meeting of the Ohio Section of the Technical Association of the Pulp and Paper Industry, Anthony Wayne Hotel, Hamilton, Ohio, January 8, 1938.

[1] Member TAPPI, Rohm & Haas Co., Inc., Philadelphia, Pa.

Starch may be considered a glucose anhydride because glucose is the final product of its hydrolysis. On the same basis it may be considered a glucoside. It is definitely known that maltose is formed before glucose in the hydrolytic scheme. There also exist dextrins before maltose is formed. In view of the fact that the internal structure of the starch molecule may be built up with groups of anhydride units, the chemical expression of $(C_6H_{10}O_5)_n$ x may be used.

It is customary to regard starch hydrolysis as a process going through the soluble starch, dextrin and sugar stages. These stages are followed by color reactions with iodine. The external appearance of starch undergoing hydrolysis shows a decrease in viscosity.

A popular conception of starch hydrolysis gives regard to liquefying and saccharifying reactions. Certain components of the amylolytic enzyme liquefy the starch by carrying it through the soluble starch to the dextrin stage. Then other components hydrolyze the dextrins to maltose and finally glucose. The liquefying and saccharifying phases can be indexed by making a combined study of the reduction in viscosity and the amount of reducing sugars formed. Additional studies on the various components of the amylolytic enzyme complex will probably lead to changes in this conception of starch hydrolysis.

As stated before, the various amylases have been separated by adsorption and their specific effects upon the starch molecule observed. When starch is hydrolyzed by a certain amylase, its ability to produce a blue color with iodine disappears when 11 per cent of the theoretical sugar is formed. On the other hand, when starch is hydrolyzed by a different amylase, its ability to form the blue color with iodine disappears only after 95 per cent of the theoretical sugar has been formed. These observations indicate that the latter splits off one molecule of sugar at a time from the end of the glucoside chain while the former splits the starch molecule into medium sized molecules with the cleavage in the middle of the glucoside chain.

The amylo-phosphatase has an entirely different action. It is unable to form sugars from starch. Its action consists in splitting the phosphoric esters which supposedly give structure to the starch molecule. This esterolysis decreases the viscosity of the starch and liberates inorganic phosphates. It appears to be a true amylo-phosphatase because it shows a very weak action on other phosphoric esters. Pure amylo-phosphatases are not available commercially at the present time.

### Types of Starches

Differences between various starches can sometimes be better shown by enzyme than by chemical studies. The specificity of the enzyme reaction is responsible for this. Chemical studies have shown variations in the alpha- and beta-amylose and phosphoric esters. Differences shown by enzyme actions cannot be classed into these groups, but they are even more profound. No individual enzyme, regardless of its origin, attacks all starches alike. Each individual starch must be studied and specific enzymes produced to gain the best practical operation.

On the basis of enzyme hydrolysis starches may be placed into two groups; tapioca, potato, rice and sago falling into one group and corn, wheat and rye into the other. It is obvious that the merits of the different starches in the paper industry cannot be discussed in a paper of this nature. It is sufficient to note that all the commercially available starches are now being hydrolyzed with enzymes and the resultant gums used for one purpose or another in the paper industry.

Starch hydrolysis is a chemical reaction catalyzed in a water medium. Free water in the reaction mixture is an absolute necessity. Little difference is noted in the degree of conversion when the solids do not exceed 12 per cent. More enzyme is necessary as the solids increase above this point. For example, about twice as much enzyme is necessary to convert a 50 per cent paste as is to convert a 25 per cent paste. The practical significance of this is to keep the solids content constant for a process once it has been established, and to use the lowest solids possible to attain the highest efficiency from the enzyme.

The function of starch as used in the paper industry today is more than just a filler. The adhesive strength of the starch is very important whether it is used for tub, coating or obviously adhesive purposes. A considerable degree of hydrolysis of the starch by any method reduces the adhesive quality per unit of starch. It is, therefore, necessary to choose a hydrolytic agent which gives a minimum loss in adhesive strength. Different enzymes show considerable variation in the amount of adhesive strength lost during conversion. The pick test with standard waxes on starch coatings gives a good index of the adhesive strength of the starch. With some enzymes the pick test of the coating decreases proportionally to the decrease in viscosity of the starch gum. With other enzymes the starch gums show quite a wide range in viscosity in which the pick test remains the same. This latter type of enzyme is by far the safest to use.

Why do we treat starches for use in the paper industry if hydrolysis is detrimental to the strength? The primary purpose for partially hydrolyzing starches is to convert them into products having a greater degree of mobility than have the starches themselves. Such treatments allow starch products to be used in higher concentrations than would normally be possible. By using higher concentrations it is possible to utilize starches and their hydrolytic products for purposes which the raw starches could not serve. As a general rule, starches should be given a minimum of hydrolysis to allow their proper handling.

There are a number of theoretical differences which should exist between enzyme treated starches and the various starch gums prepared commercially for the paper industry. It is the exception rather than the rule to detect any of these possible differences in commercial operation. Enzyme treated starches are used in tub sizing a wide variety of papers. The effects obtained range from merely laying the surface fibres with dilute starch solutions to greatly improving the strength and physical characteristics by the use of starch solutions having a Beaume of 7 or higher. The practical paper-maker has found it advantageous to prepare starch gums of different fluidities for tub sizing different grades of papers. The flexibility of the enzyme conversion process readily lends itself to such manipulations.

### Coated Paper Application

Technicians in coating mills proclaim the enzyme converted starch as efficient as any starch product for binding pigments. If the enzyme converted starch is made up in high solids, the maximum solids for the finished coating color may be obtained. Coating colors having solids of 30 to 60 per cent are now being produced with this type of starch product. It is necessary to study the dispersion of the coating pigments as well as other ingredients of the coating color when using the enzyme converted starches. This is especially true when calcium carbonate and calcined clay are used as pigments. Starch coatings are not waterproof and cannot be substituted for protein coatings if waterproofing is a requisite. However, the printing quality of starch coatings is exceptionally good with the result that this type of coating is now being used in cases where casein was formerly used.

Adhesives are being made by converting starch pastes of very high solids. The tuber starches are more commonly used than the cereal starches because they can be made up in higher solids and because they usually exhibit more tack. Converted starch pastes of 45 to 55 per cent solids find a variety of uses in laminating different papers and boards. The degree of conversion is adjusted to give fluid pastes in some instances and solid pastes in others. The pastes are applied cold when laminating light weight stock and at higher temperatures when laminating boards. For example, playing card stock may be laminated with a cold paste containing 25 per cents solids while automobile panels are sometimes laminated at 175 deg. F. with pastes of 55 per cent solids. In special cases the starch pastes are plasticized and the pH adjusted to either alkaline or acid reactions. Adhesives prepared with enzyme converted starches show remarkable water resistance. For some reason or other not explainable by present theories they are more resistant to re-wetting than are commercially prepared starch gums. This has been definitely demonstrated in a number of cases by the soak tests of laminated boards.

Enzyme converted starches are being used more and more for calender sizing. Solutions from 2 to 18 percent are being used, depending upon the desired effects. Such starch solutions may be used by themselves or in combination with waxes.

### Experimental Trials Show Little Difference

There is considerable speculation concerning the advisability of using enzyme converted starches in the beater. For that matter different men in the paper industry disagree on whether or not raw or converted starches should be used. Experimental trials comparing the beater sizing qualities of raw and converted starches usually show very little difference. If any paper-maker feels that he should use converted starches, the starches prepared by enzyme conversion should prove satisfactory.

Another type of enzyme which can be used by the paper industry is a sucrase or invertase. Invert sugars are used as plasticizing agents in numerous cases. The invert sugar is prepared from sucrose by hydrolysis with an enzyme or acid to produce glucose and levulose. It is the levulose of the invert sugar that gives the plasticizing effect. It is extremely soluble and difficult to crystalize which account for its plasticizing properties. A reaction of this type is carried to its ultimate end. The qualities of a plasticizing agent prepared in the mill by enzyme hydrolysis of sucrose should be no different than those of invert sugar, but the paper-maker should be able to do this at a lower cost.

### Protein Hydrolysis

Proteolytic enzymes are used to some extent in the paper industry and it is quite probable that they will be used more widely in the future. Proteolytic enzymes comprise that group of enzymes which act upon proteins. The protein molecule has a very high molecular weight and is built up by different combinations of amino acids. Since enzymes are so specific in their reactions and since the combinations of amino acids to form proteins are so numerous, there is a host of proteolytic enzymes. In discussing protein hydrolysis by means of enzymes, it is convenient to use the following hydrolytic scheme; protein to peptone to polypeptides to peptides to amino acids.

### Show Decreased Strength

Proteins hydrolyzed by any agent show decreased strength. In comparing the hydrolysis of enzymes with inorganic agents it has been established that the enzyme hydrolysis is of a milder nature and that it results in less loss of strength than in cases where inorganic agents are used. In spite of this fact the loss in strength due to enzyme hydrolysis is quite perceptable and proteins should be subjected to the minimum amount of hydrolysis necessary.

Proteins used in coatings to bind the pigments and for adhesives in general should retain as much strength as possible. Hydrolysis of proteins to produce a marked change in viscosity definitely decreases their binding power. If the viscosity of the coating color is not too great under the conditions for application, it is better not to hydrolyze at all. If higher solids are to be obtained under conditions where strength is not of primary importance, then enzyme hydrolysis of the protein should find a place in the process. Commercially prepared protein glues are usually partially hydrolyzed to maintain fluidity. It is always necessary to sacrifice strength in the preparation of glues and enzymatic hydrolysis has been favorably accepted.

Proteolytic enzymes may be used in the recovery of protein sized or coated broke, especially after hardening with formaldehyde. Unhardened protein sized papers can easily be reworked in slightly alkaline medium while the hardened protein sized papers require more drastic treatment. The addition of a proteolytic enzyme to the latter type of broke has proven an economic way of recovery in some cases. In a process of this type the enzyme hydrolysis may be carried to completion because there would be no point in preserving any strength in the protein.

### Of Primary Importance in Various Industries

Enzymes are now of primary importance in a number of processes in various industries. This was made possible by detailed study and patient developmental work. It is not unlikely to assume that various enzymes will take similar places in various processes associated with paper making in the very near future.

# Review Of The Paper Industry Literature

**Abstracts Compiled By the Abstracts and Bibliography Committee of the Technical Association of the Pulp and Paper Industry, A. Papineau-Couture, John F. Ohlson and Clarence J. West, Chairman of the Committee.**

**Copies of United States Patents can be obtained from the United States Patent Office, Washington, D. C. for 10 cents each. Send currency, not stamps.**

## Specialties

**Crepe Paper and Its Manufacture.** Georg Böttinger. Papier-Ztg. 62, no. 95: 1648, 1650 (Nov. 27, 1937); Papir-J. 25, no. 21: 295-8 (Nov. 15, 1937); B. I. P. C. 8:159.—A description is given of several German constructions for creping different kinds of paper, from thin tissue to heavy kraft paper, simultaneously in both directions.—C.J.W.

**Genuine Handmade Paper.** Wochbl. Papierfabr. 68, no. 39: 741; no. 43: 819 (Sept. 25, Oct. 23, 1937); B. I. P. C. 8:160.—The inquirer asks what kind of equipment is needed for the manufacture of handmade paper, also if the manufacture can be started in connection with a board specialty mill. While such an installation is possible, further details are required of present equipment and quality and type of paper to be manufactured before additional advice can be given. Generally speaking, the manufacture of genuine vat paper is not a profitable enterprise, since it is used by very few. Suitable, very pure water and long experience are necessary. The existing mills in Germany which specialize in this field are ample to supply the country's demand.—C.J.W.

**Mottling Fibers From Rayon.** Wochbl. Papierfabr. 68, no. 42: 797; no. 46: 873 (Oct. 30, Nov. 13, 1937); B. I. P. C. 8:160.—The inquirer asks how mottling fibers can be prepared from rayon, also the technique of producing surface mottling in strip upon the Fourdrinier and vat machine. One answer considers the use of rayon for mottling fibers hardly worth while, since the danger of formation of knots is too great; mottling effects in strips are produced through special slices on the Fourdrinier machine; the procedure is more complicated upon the vat machine and depends upon several details which must be known before further advice can be given. Another answer describes the utilization of rayon fibers for this purpose; when of the correct color they are cut upon the rag cutter and briefly beaten in the beater; when dyeing is required the beating and dyeing procedures are carried out at once. The fibers must boil for ¾-1 hour under constant circulation; they are then allowed to cool and are sized with rosin size and alum.—C.J.W.

**Investigations of Paper Bags With Regard to Moisture Permeability and Strength.** E. Sachsenberg. Papier-Ztg. 62, no. 84: 1428-1429; no. 85: 1444-1446 (Oct. 20, 23, 1937); B. I. P. C. 8:175.—Eight different kinds of multiwall bags for shipping hygroscopic fertilizers were tested with regard to moisture permeability and strength properties. The testing instruments and procedures are described in detail. It was found that bags with aluminum foil layers are far more resistant to moisture than the best bituminized bags; bags whose long side was cut in the cross and not in the machine direction were found to be far more resistant to bursting experiments.—C.J.W.

**Wall Paper.** Ind. carta 4, no. 11: 433-434 (Nov., 1937); B. I. P. C. 8:210.—The origin and development of the wall paper industry in Italy are discussed. A brief description of raw materials employed, processes and kinds of wall paper manufactured is given.—C.J.W.

**Machinery for Manufacturing Block-bottom Bags.** Papier-Ztg. 62, no. 91/92: 1552, 1554, 1556, 1558, 1560-1562, 1568-1569 (Nov. 13, 1937); B. I. P. C. 8:210.—A description of the machinery and procedure for making block-bottom bags is given, as well as directions for avoiding certain troubles which are liable to occur.—C.J.W.

**Quality Demands for Printed Matter Used in Banking.** Wilhelm Kord-Ruwisch. Papier-Ztg. 62, no. 88: 1502-1504 (Nov. 3, 1937).—A discussion of different methods for safeguarding document papers.—C.J.W.

**Gummed Paper.** Enrico Malerba. Ind. carta 4, no. 9: 332 (Sept., 1937); B. I. P. C. 8:161.—Various adhesives for labels are described with special reference to the surface to which they are to be pasted, such as glass or chinaware, cloth, metal surfaces, etc.—C.J.W.

**Manufacture of Coated Art Paper.** Papir-J. 25, no. 23: 315-318 (Dec. 15, 1937); B. I. P. C. 8:205.—The manufacture of coated art paper is described, with special reference to the body paper, coating materials and the coating, drying and calendering processes. The manufacture of this kind of paper was taken up in Norway by the mill Saugbrugsforeningen as late as 1936; it is the only mill in this country specializing in the paper.—C.J.W.

**Changes in Printing Papers.** Kartonnagen- u. Papierwaren-Ztg. 41, no. 51: 541-542; no. 52: 554, 556 (Dec. 17, 24, 1937); B. I. P. C. 8:208.—Reference is made to stretching and shrinking of paper during the printing process and the difficulties of obtaining correct register in color printing. The importance of correct conditioning and storing of paper is stressed and several small expedients for the printer are described. The second part of the article describes the special problem of a stamp printing establishment. The paper after printing stretched 5 mm., and after drying shrank 7 mm. causing the perforations to appear in the printed sections instead of in between them. The moistening of a lot of paper sufficient for the day's work is suggested as remedy; this paper is transferred to the printing room in small lots and immediately returned. All printed sheets should be gummed as soon as possible after printing and then perforated.—C.J.W.

**Manufacture of Compound Paper.** A. S. Lowry. Brit. pat. 465,522 (Oct. 5, 1935).—Paper is laminated with intermediate layers of rubber latex containing sodium silicate as an adhesive, the rubber being subsequently dried and vulcanized.—A.P.-C.

**Waterproof Wrapping Eliminates Reconditioning of Paper.** L. M. Crowther. Am. Paper Merchant 34, no. 12:38 (Dec., 1937); B. I. P. C. 8:209. —The author claims that conditioned paper should be wrapped in a waterproof wrapper to avoid the necessity of reconditioning; otherwise the humidity of the paper can be radically changed during shipment unless protected in a manner which prevents absorption of moisture.—C.J.W.

**Oil and Fat Emulsions in the Textile Industry.** A. Foulon. Allgem. Oel- u. Fett-Ztg. 34: 451-453 (1937); C. A. 32:787.—The methods of using emulsions to impregnate textiles and paper with drying oils, fats, metallic soaps, waxes or minerals for waterproofing or other reasons are described. —C.J.W.

**Bituminous Concrete and Its Applications in the Paper Industry.** A. Lambrette. Papeterie 59: 1101-1105 (Dec. 10, 1937).—A brief discussion of the properties and advantages of asphaltic concrete, describing the manner of applying it and its possible applications in the paper industry.—A.P.-C.

**Sulphonated Oils in Paper Coating Processes.** H. W. Rose. Paper Trade J. 105, no. 27: 22-24 (Dec. 30, 1937).—An outline of the nature and origin of fats and oils, their manufacture into sulphonated products and the methods of analyzing and evaluating these products.—A.P.-C.

**Packing Material for Goods Which Are Sensitive to Moisture.** Norddeuts. Seekabelwerke A. G. Brit. pat. 465,555 (Aug. 19, 1936).—Foil (about 0.01 mm. thick) produced from flexible polystyrene or its homologues is made to adhere to one or both sides of paper, fabric, etc., by soaking in benzene or in ethanol.—A.P.-C.

**Manufacture of a Permeable Imitation Leather.** T. Shiraishi. Brit. pat. 462,783 (March 23, 1936).—Sheet material of carded cellulose fiber is wetted with a natural or artificial aqueous dispersion of rubber containing a finely-divided alkaline-earth carbonate (preferably magnesium carbonate), passed through an acid coagulant which forms pores by the liberation of carbon dioxide, and the rubber is vulcanized.—A.P.-C.

**Improvement to Nonshrinkable Sheets and to Waterproofed Fibers.** American Reenforced Paper Co. Belg. pat. 421,586 (June 30, 1937).—Cellulosic fibers or articles made therefrom are treated at atmospheric pressure with an aqueous solution of urea, formaldehyde and ammonium thiocyanate.—A.P.-C.

**Fibrous Cellulose Container for Oils and the Like.** C. Arnold, assignee of Standard Oil Co. Brit. pat. 467,529 (April 9, 1936).—The inner surface of the cellulose container is treated with a layer of oil-resistant water-glass containing glycerol, less than 2 per cent of gum arabic, less than 2 per cent of dextrin and less than 0.25 per cent of soap. In order to prevent moisture being removed from the waterglass by the cellulose, the latter is saturated with water, or a moistureproof layer (casein, asphalt, etc., with or without paper) is interposed between the cellulose and the waterglass layers.—A.P.-C.

**Nitrocellulose From Wood Pulp.** J. Seilberlich. Pulp Paper Mag. Can. 39: 17-19 (Jan., 1938).—A literature and patent review, with bibliography of 55 references.—A.P.-C.

**Molding Pulp Beams.** Smith, Stone and Knight, Ltd., and Thomas P. Smith. Brit. pat. 467,565 (June 16, 1937).—In molding girders, beams, tubes, etc., from paper pulp or other fibrous material by extrusion, reinforcing members are embedded in the article during extrusion.—A.P.-C.

**Reinforced Paper.** Heinrich Kleibaumhüter and Peter Kleibaumhüter. Brit. pat. 469,342 (July 23, 1937).—Separate applications of paper stuff are made to one or more thin layers of unspun, undivided hard fibers, e.g., sisal, hemp, manila, jute, oakum, to form reinforced paper for wrapping, etc. An apparatus is described.—A.P.-C.

**Manufacture of Laminated Boards.** G. T. Morgan and N. J. Megson. Brit. pat. 465,411 (Nov. 4, 1935).—Paper sheets are impregnated with solutions of (a) hexamethylenetetramine or formaldehyde, etc., and (b) a polyhydric phenol, e.g., resorcinol, a tannin, e.g., catechin, or an amino-phenol; the sheets are then piled and hot-pressed without preheating.—A.P.-C.

**Apparatus for Coating Paper.** R. S. Bracewell. Brit. pat. 465,556 (Aug. 19, 1936).—The coating agent is continuously applied to the dried paper web by discharging it centrifugally as a spray from a rapidly rotating roll which is supplied by means of two other rolls. These are grooved to assist in uniform distribution of the spray. The usual coating agents may be used, or they may be in the form of a powder (e.g., aluminum dust, mica, etc.).—A.P.-C.

**Safety Paper.** David Russell. Brit. pat. 469,023 (July 16, 1937).—Addn. to 437,969.—The reaction metal or metal oxide of 437,969, is so finely divided that it all passes through a 240-mesh sieve, or all through a 200-mesh sieve and 90 per cent or more through a 300-mesh sieve. The metal, etc., may be used wholly or mainly in an inner ply of a multiple-ply paper, or coarser metal, etc., may be used therein; adjacent plies may contain other security materials. —A.P.-C.

**Providing Fibrous Surfaces With a Water-resistant Coating.** International Patents Development Co. Fr. pat. 820,046.—Paper or other fibrous products are coated with a solution of zeine and a reactive aldehyde such as formaldehyde, paraldehyde, etc.—A.P.-C.

**Parchment Paper.** John A. Newman assignor to Paterson Parchment Paper Co. Can. pat. 368,139 (Aug. 17, 1937).—Dry waxed paper, waterproof, resistant to dialysis, capable of retarding evaporation of moisture of articles wrapped in it and receiving and retaining printer's ink on either surface, is prepared by passing a porous paper web through an acid bath, e.g., 53 deg. Bé. sulphuric acid at 60 deg. F., regulating the treatment to a light parchmentization leaving the web porous with its interior fibrous and substantially unparchmentized, removing the acid, drying, subjecting to dry wax process to impregnate the interior fibrous structure with wax and leave the surface relatively uncoated, congealing the wax in the web, and locally applying heat under pressure to create patterns of greater transparency. —A.P.-C.

**Parchment and Its Uses.** Lucien M. C. Champsaur. Fr. pat. 47,016 (Nov. 30, 1936); addn. to Fr. pat. 800,648.—To allow the application of a varnish, the parchment is treated with a supplying agent, such as glycerin, containing a size such as dextrin. A thickener such as calcium chloride, may be added to the glycerin.—A.P.-C.

# Imports of Paper and Paper Stock

**Giving Manifests of New York, Boston, Philadelphia and Other Ports, of Newsprint, Wrapping, Writing, Coated, Blotting, Tissue, Strawboard, Wallboard, Cigarette Papers, Sulphite, Kraft and Ground Wood Pulp.**

## NEW YORK IMPORTS

WEEK ENDING JUNE 11, 1938

SUMMARY

Cigarette paper .....547 cases
Wall paper .....1 cs., 5 bxs, 2 bls.
Paper hangings .....1 cs., 5 bls.
Newsprint .....20,053 rolls
Wrapping paper .....30 cs., 2,269 rolls, 289 bls.
Packing paper .....250 bls.
Drawing paper .....7 cs.
Filter paper .....13 cs.
Surface coated paper .....119 cs.
Surface Baryta Coated Paper .....8 cs., 70 crates
Metal covered paper .....12 cs.
Photo paper .....9 cs.
Decalcomania paper .....6 cs.
Decalcomanias .....4 cs.
Transfer paper .....22 cs.
Transparent paper .....1 cs.
Colored paper .....1 cs.
Greaseproof paper .....28 cs.
Tissue paper .....7 cs.
Writing paper .....10 cs.
Paper tubes .....48 cs., 24 ctns.
Miscellaneous paper .....17 cs., 40 bls., 227 rolls.

### CIGARETTE PAPER

R. J. Reynolds Tobacco Co., *Pr. Harding,* Havre, 70 cs.
De Manduit Paper Corp., *Ile de France,* Havre, 1 cs.
H. H. Straus, *Schodack,* Bordeaux, 347 cs.
Champagne Paper Corp., *Schodack,* Bordeaux, 25 cs.
American Tobacco Co., *Schodack,* Bordeaux, 310 cs.
R. J. Reynolds Tobacco Co., *Manhattan,* Havre, 60 cs.
Braunstein Freres, Inc., *Champlain,* Havre, 18 cs.
Champagne Paper Corp., *Champlain,* Havre, 317 cs.

### WALL PAPER

———, *Vinni, Kobe,* 8 bls., 1 cs.
S. K. Lonegren, *Drottningholm,* Gothenburg, 5 bxs.
F. J. Emmerich, *Deutschland,* Hamburg, 2 bls.

### PAPER HANGINGS

W. H. S. Lloyd & Co., *American Banker,* London, 1 cs., 5 bls.

### NEWSPRINT

N Y. Evening Journal, *Pr. Harding,* Hamburg, 178 rolls.
N. Y. Evening Journal, *Manhattan,* Hamburg, 178 rolls.
International Paper Co., *G.T.D.,* Gatineau, 312 rolls.
H. G. Craig Co. Inc., *Donpaco,* Donnacona, 312 rolls.
H. G. Craig Co. Inc., *A.C.D.,* Donnacona, 356 rolls.
Jay Madden Corp., *Tisnaren,* Kotka, 145 rolls.
Jay Madden Corp., *Deutschland,* Hamburg, 267 rolls.
Perkins Goodwin & Co., *Deutschland,* Hamburg, 325 rolls.

### WRAPPING PAPER

———, *Deutschland,* Hamburg, 24 cs.
M. M. Cohen, *Pr. Harding,* Hamburg, 301 rolls, 31 bls.
Alfred Bleyer & Co., *Pr. Harding,* Hamburg, 743 rolls, 22 bls.
H. Fuchs & Son, *Pr. Harding,* Hamburg, 55 rolls, 118 bls.
Gilson Bros., Inc., *Pr. Harding,* Hamburg, 268 rolls.
Metropolitan Paper & Bag Corp., *Pr. Harding,* Hamburg, 572 rolls, 116 bls.
———, *Drottningholm,* Gothenburg, 183 rolls.
Keller Dorian Paper Co., *Exeter,* Marseilles, 6 cs.
Walker Goulard Plehn Co., *Manhattan,* Hamburg, 147 rolls.

### PACKING PAPER

J. P. Heffernan Paper Co., *Exeter,* Genoa, 150 bls.
J. P. Heffernan Paper Co., *Deutschland,* Hamburg, 100 bls.

### FILTER PAPER

H. Reeve Angel & Co. Inc., *American Banker,* London, 11 cs.
American Express Co., *Pr. Adams,* Marseilles, 1 cs.

### DRAWING PAPER

H. Reeve Angel & Co. Inc., *American Banker,* London, 5 cs.
Keuffel & Esser Co., *American Banker,* London, 2 cs.

### SURFACE COATED PAPER

Gevaert Co. of America, *Black Hawk,* Antwerp, 35 cs.
Gevaert Co. of America, *Westernland,* Antwerp, 69 cs.
L. A. Consmiller, Inc., *Columbus,* Bremen, 5 cs.
Hensel Bruckman & Lorbacher, *Deutschland,* Hamburg, 5 cs.
C. Happel, *Deutschland,* Hamburg, 5 cs.

### SURFACE BARYTA COATED PAPER

———, *Westernland,* Antwerp, 7 cs.
Globe Shipping Co., *Columbus,* Bremen, 70 crates, 1 cs.

### METAL COVERED PAPER

K. Pauli Co., *Columbus,* Bremen, 12 cs.

### PHOTO PAPER

Medo Photo-Supply Co., *Britannic,* London, 3 cs.
J. J. Gavin Co. Inc., *Queen Mary,* Southampton, 5 cs. (unsensitized)
Eastman Kodak Co., *American Banker,* London, 1 cs.

### DECALCOMANIA PAPER

B. F. Drakenfeld & Co., *American Importer,* Liverpool, 6 cs.

### DECALCOMANIAS

Sellers Transportation Co., *Columbus,* Bremen, 4 cs.

### TRANSFER PAPER

J H. & G. B. Siebold, Inc., *Pr. Harding,* Hamburg, 22 cs.

### TRANSPARENT PAPER

———, *N. Amsterdam,* Rotterdam, 1 cs.

### TISSUE PAPER

M. Snedeker Corp., *American Banker,* London, 1 cs.
———, *Pr. Adams,* Genoa, 6 cs.

### COLORED PAPER

D. C. Andrews & Co., *Columbus,* Bremen, 1 cs.

### WRITING PAPER

H. W. Robinson & Co., *Manhattan,* Hamburg, 10 cs.

### GREASE-PROOF PAPER

E. Dietzgen & Co., *Deutschland,* Hamburg, 28 cs.

### PAPER TUBES

———, *Columbus,* Bremen, 48 cs., 24 ctns.

### MISCELLANEOUS PAPER

C. Happel, *Pr. Harding,* Hamburg, 2 cs.
The Borregaard Co. Inc., *Drottningholm,* Gothenburg, 40 bls., 227 rolls.
Coty Processing Co., *Ile de France,* Havre, 4 cs.
Coty Processing Co., *Champlain,* Havre, 8 cs.
Pinaud, Inc., *Champlain,* Havre, 3 cs.

### RAGS, BAGGINGS, ETC.

W. J. Green, *Skagerak,* Bombay, 85 bls. rags.
Continental Bank Trust Co., *Skagerak,* Bombay, 106 bls. rags.
Chase National Bank, *Skagerak,* Bombay, 50 bls. cotton waste.
E. J. Keller Co. Inc., *Black Hawk,* ———, 134 bls. rags.

F. J. Fawcett, *Black Hawk,* Antwerp, 25 bls. flaxwaste.
Van Oppen & Co., *Black Hawk,* Antwerp, 4 bls. rags.
Beacon Wiper Supply Co., *Vinni,* Kobe, 25 bls. rags.
———, *Vinni,* Kobe, 4 bls. thread waste.
Chase National Bank, *Vinni,* Kobe, 15 bls. rags.
———, *American Importer,* Manchester, 92 bls. bagging.
———, *American Importer,* Manchester, 123 bls. paper stock.
A. H. Searle, *American Importer,* Manchester, 28 bls. paper-stock.
Chase National Bank, *Turksib,* Leningrad, 1,497 bls. linen rags, 79 bls. rags, 1,230 bls. linen rags & waste, 130 bls. linen & cotton cuttings.
Banco Coml Italiane Trust Co., *Turksib,* Leningrad, 519 bls. waste.
Chase National Bank, *Schodack,* Bordeaux, 307 bls. rags.
Atlas Waste Manfg Co., *Mexico,* Havana, 29 bls. cotton waste.
Philadelphia National Bank, *Exeter,* Alexandria, 118 bls. rags.
Chase National Bank, *R. Maersk,* London, 38 bls. felt waste.
Manufacturers Trust Co., *R. Maersk,* London, 12 bls. paper-stock.
J. Cohen & Son Co. Inc., *R. Maersk,* London, 9 bls. rags.
W. Steck & Co., *R. Maersk,* Antwerp, 320 bls. flaxwaste.
E. J. Keller Co. Inc., *Grete Maersk,* ———, 61 bls. hemp waste.
Burka Bagging Corp., *Fort Amherst,* Halifax, 119 bls. bagging.

HIDECUTTINGS, ETC.

J. J. Murphy & Co., *Laconia,* Liverpool, 980 bags hidecuttings.
Darmstadt Scott & Courtney, *Extavia,* Genoa, 124 bls. glue-stock.
N. L. Lederer, *N. Amsterdam,* Rotterdam, 100 bags bone-glue.

CHINA CLAY

Whitaker Clark & Daniels, *N. Amsterdam,* Rotterdam, 260 bags.

OLD ROPE

Van Oppen & Co., *Black Hawk,* Rotterdam, 11 bls.
Van Oppen & Co., *Black Hawk,* Antwerp, 29 bls.
W. Steck & Co., *Spaarndam,* Rotterdam, 42 coils.
G. A. Henshaw & Son, *R. Maersk,* London, 52 coils.
Banco Coml Italiane Trust Co., *R. Maersk,* London, 60 coils.

WOOD PULP

Perkins Goodwin & Co., *Drottningholm,* Gothenburg, 150 bls. sulphite.
Absorbo Beer Pad Co., *St. Louis,* Hamburg, 200 bls. wood pulp 22 tons.
Bulkley Dunton Pulp Co., Inc., *Spaarndam,* ———, 140 bls. wood pulp.
Price & Pierce, Ltd., *Tisnaren,* Hornefors, 750 bls. unbleached sulphite.
Perkins Goodwin & Co., *Tisnaren,* Hornefors, 150 bls. sulphite.
Pulp Sales Corp., *Tisnaren,* Yxpila, 633 bls. sulphate.
Pulp Sales Corp., *Tisnaren,* Rauma, 1,613 bls. sulphate.
Lagerloef Trading Co., *Tisnaren,* Rauma, 1,300 bls. mechanically ground pulp.
Parsons & Whittemore, Inc., *Manhattan,* Hamburg, 660 bls. wood pulp.
Pulp Sales Corp., *Scanmail,* Wiborg, 1,325 bls. sulphite, 265 tons.
Pulp Sales Corp., *Scanmail,* Wiborg, 2,078 bls. sulphate, 455 tons.

WOOD PULP BOARDS

H. Fuchs & Son, *Drottningholm,* Gothenburg, 47 cases.
Jay Madden Corp., *Scanmail,* Kotka, 90 rolls, 78 tons.

## NEWARK IMPORTS

WEEK ENDING JUNE 11, 1938

Perkins Goodwin & Co., *Apohaqui,* St. George, N. B., 195 tons wood pulp.

## ALBANY IMPORTS

WEEK ENDING JUNE 11, 1938

———, *Tisnaren,* Hornefors, 2,375 bls. sulphite.
Bankers Trust Co., *Tisnaren,* Hornefors, 1,050 bls. sulphite.
———, *Tisnaren,* Hornefors, 2 bxs., 461 bdls wall board.
Pagel Horton & Co. Inc., *Tisnaren,* Hornefors, 2107 bls. sulphite.
Pulp Sales Corp., *Tisnaren,* Yxpila, 1,280 bls. sulphate, 947 bls. sulphite.
Pulp Sales Corp., *Tisnaren,* Rauma, 2,182 bls. sulphite.
Pulp Sales Corp., *Tisnaren,* Kotka, 1,600 bls. sulphite, 204 bls. sulphate.
Parsons & Whittemore, *Tisnaren,* Tallinin, 2,525 bls. sulphite.

## BOSTON IMPORTS

WEEK ENDING JUNE 11, 1938

E. Butterworth & Co. Inc., *Black Hawk,* Rotterdam, 320 bls. glue stock.
J. O. Whitten & Co., *Black Hawk,* Rotterdam, 20 bls. filter mass.
Royal Manfg. Co., *Black Hawk,* Antwerp, 58 bls. cotton waste.
D. C. Andrews & Co., *Black Hawk,* Antwerp, 17 bls. cotton waste.
E. Butterworth & Co. Inc., *Black Hawk,* Antwerp, 112 bls. glue stock.
Parsons & Whittemore, Inc., *Konigsberg,* ———, 1,333 bls. wood pulp.

## PHILADELPHIA IMPORTS

WEEK ENDING JUNE 11, 1938

E. J. Keller Co. Inc., *Schodack,* ———, 74 bls. rags.
Irving Trust Co., *Spaarndam,* Rotterdam, 21 bls. picker waste.
Central Penn National Bank, *Spaarndam,* Rotterdam, 30 cs. grease-proof paper.
United Clay Mines, *Spaarndam,* Rotterdam, 224 bags china clay.
Kerr Maurer Co., *R. Maersk,* London, 225 coils, 10 bls. old rope.

## BALTIMORE IMPORTS

WEEK ENDING JUNE 11, 1938

Congoleum Nairn Co., *Schodack,* Havre, 1,734 bls. rags.
Congoleum Nairn Co., *Schodack,* Bordeaux, 194 bls. rags.
Price & Pierce, Ltd., *Tisnaren,* Hornefors, 2,310 bls. sulphite.
———, *Tisnaren,* Hornefors, 750 bls. sulphite.
Central Hanover Bank Trust Co., *Tisnaren,* Hornefors, 375 bls. sulphite.
———, *Tisnaren,* Hornefors, 1,786 bdls., 9 bxs. wall board.
Bankers Trust Co., *Tisnaren,* Hornefors, 4,800 bls. sulphite.
Guaranty Trust Co., *Tisnaren,* Hornefors, 2,400 bls. chemical pulp.
Pulp Sales Corp., *Tisnaren,* Rauma, 2,933 bls. sulphite.
Jay Madden Corp., *Tisnaren,* Kotka, 167 bls. wood pulp boards.
F. H. Shallus, Co., *Scanmail,* Kotka, 81 rolls newsprint.
Scripps Howard Supply Co. Inc., *Scanmail,* Kotka, 71 rolls newsprint.
Wilkinson Bros., & Co. Inc., *Scanmail,* Kotka, 82 rolls newsprint.
Jay Madden Corp., *Scanmail,* Kotka, 1,908 rolls newsprint.
Lagerloef Trading Co., *Scanmail,* Helsingfors, 520 bls. mechanically ground pulp, 104 tons.
Bulkley Dunton Pulp Co. Inc., *Scanmail,* ———, 900 bls. sulphite, 152 tons.
Price & Pierce, Ltd., *Scanmail,* Stockholm, 210 bls. bleached sulphite, 35 tons.
Parsons & Whittemore, Inc., *City of Havre,* ———, 1,335 bls. wood pulp.

## NORFOLK IMPORTS

WEEK ENDING JUNE 11, 1938

N. Y. Trust Co., *Schodack,* Havre, 140 bls. bagging.
Darmstadt Scott & Courtney, *Skagerak,* Bombay, 135 bls. rags.

## MONTREAL IMPORTS

WEEK ENDING JUNE 11, 1938

Gottesman & Co. Inc., *Lagaholm,* Sweden, 4,800 bls. unbleached sulphate.
Gottesman & Co. Inc., *Dalmore,* Sweden, 5,160 bls. unbleached sulphite.

## New York Market Review

Office of the PAPER TRADE JOURNAL,
Wednesday, June 15, 1938.

The news of the week in the wholesale paper market centers about prices and if the current price reductions in all grades of kraft and in some grades of book papers may result in a more general decline from prevailing market quotations. The Bryant Paper Company has announced a new schedule of prices, effective as of June 6. The reduction in book papers range from .35 to .60 per hundred pounds or from $7 to $12 per ton. The lower minimum reduction, the Bryant Paper Company stated, applies to 5,000 pound lots, while the differential covers larger quantities. At this date, no other manufacturers are reported to have made any changes from prevailing market prices on white papers, nor will they comment on the price situation.

The impending reduction in kraft paper prices has resulted this week in an official downward revision in market prices of all grades of kraft papers, from No. 1 northern down to $4.50 to $5.12, to the standard or southern wrapping grade which has been reduced from $4 to $3.50 per cwt., delivered in zone A.

The demand for newsprint continues at a moderately high level and contract shipments are moving in good volume. Prices are unchanged and no change in the prevailing market prices are anticipated in the trade.

### Chemical Pulp

The demand for chemical pulp continues to be reported as light and no change in the volume of business has occurred for the current week. The price differential on domestic and foreign prime bleached sulphite pulp is narrower and a reduction in the price of domestic kraft, f.o.b. pulp mill, is reported.

### Mechanical Pulp

The demand for mechanical pulp continues light. No change in demand or prices is reported for this week.

### Old Rope and Bagging

The old rope market reports very little business being done and due to the extremely light demand prices are practically nominal at prevailing quotations. The demand for old bagging is likewise very light and prices are unchanged for the week.

### Rags

The demand for new and old rags continues light. Prices on many grades are virtually nominal. With the exception of new white No. 1 shirt cuttings which are lower this week, no changes are reported at this date. The foreign rag market is inactive and nominal prices prevail.

### Waste Paper

No change in demand or prices has occurred in paper stock for the current week. Little business is being done and the trade is expecting little if any change in the market situation in the immediate future.

### Twine

The demand for twine is rather light. Prices continue unchanged at prevailing market quotations.

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## Annual Paper Trade Story

Pulp and paper executives, particularly those associated with foreign trade or foreign markets, will be interested in the new publication "1937 Review of United States Foreign Trade in Pulp and Paper" just released by the Pulp and Paper Section, Forest Products Division, Bureau of Foreign and Domestic Commerce. The story carries 3-year comparisons of both exports and imports and will therefore give a particularly good working understanding of our foreign pulp and paper markets, where their products go, their volume and their values, as well as our foreign sources of pulp and paper.

The body of this report, statistical in nature, is divided into two sections, the first showing imports of pulp, paper, and paper base stocks by major countries of origin; the second showing exports of these items by major countries of destination. Comparable 1937, 1936, and 1935 figures are given and brief summaries precede the statistical data of each section.

Imports of pulpwood, rags, waste bagging, etc., are tabulated in the report. Imports of standard newsprint paper, uncoated book and printing paper, surface-coated paper and note, drawing, tissue, cigarette, sulphite wrapping, kraft wrapping, greaseproof and waterproof papers are shown and so too, are imports of paper boxes, pulpboard in rolls, cigarette books and covers, decalcomania, etc. In each case the imports are shown by countries of origin.

Exports of pulpwoods, wood pulp, rags for paper stocks, waste bagging etc., are tabulated in the report. Exports of book paper, cover paper, overissue and old newspaper, kraft wrapping, surface-coated paper and tissue paper are shown and so, too, are exports of paper towels and napkins, boxboard, bristols and bristol board, fiber insulating board, sheathing and building paper, etc. Exports are in each case showing by countries of destination.

"1937 Review of the United States Foreign Trade in Pulp and Paper" may be secured by addressing the Pulp and Paper Section, Forest Products Division, Bureau of Foreign and Domestic Commerce, Washington, D. C., or through any of the District Offices of the Bureau. No charge is being made for the publication.

# Miscellaneous Markets

Office of the PAPER TRADE JOURNAL,
Wednesday, June 15, 1938.

BLANC FIXE—The demand for blanc fixe is steady at a moderate level and prices are unchanged at prevailing quotations. The pulp is quoted at from $42.50 to $45 per ton, in bulk; the powder is offered at from 3½ to 3¾ cents per pound, in barrels, at works.

BLEACHING POWDER—The quotations on bleaching powder are unchanged at prevailing prices. Bleaching powder is quoted at from $2 to $2.25 per 100 pounds, in drums, at works.

CASEIN—The demand for casein is reported as fair. Prices are fractionally higher on some grades. Domestic ground casein is quoted at from 7½ to 8 cents per pound; domestic finely ground at from 8½ to 9 cents per pound; all prices in bags, car lot quantities.

CAUSTIC SODA—The quotations on caustic soda continue unchanged at prevailing prices. Solid caustic soda is quoted at from $2.10 to $2.30 per 100 pounds; flake and ground at from $2.50 to $2.70 per 100 pounds, in drums, at works.

CHINA CLAY—The demand for china clay continues at a moderate level. Prices are unchanged. Imported clay is quoted at from $14.50 to $25 per ton, ship side. Domestic filler clay is offered at from $6.50 to $12 per ton; coating clay at from $11 to $22 per ton, at mines.

CHLORINE—Quotations on chlorine are unchanged and conform to prevailing prices. Chlorine is quoted at 2.15 per 100 pounds, in single-unit tank cars, f.o.b., works.

ROSIN—The demand for rosin is reported as fair. Quotations on some grades are a little higher for the week. "G" gum rosin is quoted at $4.22; wood rosin at $4.25 per 280 pounds, gross weight, in barrels, at Savannah. Seventy per cent gum rosin size is quoted at $2.52 per 100 pounds, f.o.b., shipping point.

SALT CAKE—The demand for salt cake is reported as moderate. Quotations range at from $12 to $13.50 per ton; chrome salt cake at from $11 to $12 per ton, f.o.b., shipping point. Imported salt cake is offered at from $14.50 to $15 per ton, Gulf or Atlantic Seaboard, on dock.

SODA ASH—Quotations on soda ash are unchanged and conform to prevailing prices. Quotations on soda ash in car lots, at works, per 100 pounds, are as follows: in bulk, $.90; in bags, $1.05; and in barrels, $1.35.

STARCH—The corn starch market is reported as firm. Prices are unchanged for the current week. Globe pearl is quoted at $2.60 per 100 pounds, in bags, and at $2.85 in barrels. Special paper starch is quoted at $2.70 per 100 pounds, in bags, and at $2.95 in barrels; all prices in car lots, f.o.b., Chicago.

SULPHATE OF ALUMINA—Quotations on sulphate of alumina are unchanged and conform to prevailing prices. The commercial grades are quoted at $1.15 per 100 pounds; iron free at $1.30 per 100 pounds, in barrels, car lot quantities, f.o.b., works.

SULPHUR—The sulphur market reports prices unchanged at prevailing quotations. Annual contracts are quoted at $18 per long ton, f.o.b., cars at mines. Spot and nearby car lots are offered at $21 per ton.

TALC—Quotations on talc continue unchanged at prevailing prices. Domestic talc is offered at from $15 to $18 per ton, Eastern mines. Imported talc is quoted at from $25 to $40 per ton, on dock.

# Market Quotations

## Paper

**(Delivered New York)**

| | | | |
|---|---|---|---|
| **News, per ton—** | | | |
| Roll, contract | $50.00 | @ | — |
| Sheets | 58.00 | @ | — |
| **Kraft—per cwt.—Delivered Zone A** | | | |
| No. 1 Northern | 4.50 | @ | 5.12½ |
| Superstandard | 4.12 | @ | 4.50 |
| Northern Standard Wrapping | 3.75 | @ | — |
| Standard Wrapping | 3.50 | @ | — |
| **Tissues—Per Ream—Carlots** | | | |
| White No. 1 | .92½ | @ | — |
| White No. 1 M. G. | .90 | @ | — |
| White No. 1½ | .67½ | @ | — |
| White No. 2 | .60 | @ | — |
| Anti-Tarnish M. G. | .75 | @ | — |
| Colored | .87½ | @ | — |
| Kraft | .75 | @ | — |
| Manila | .60 | @ | — |
| Unbl. Toilet, 1 M. | 3.20 | @ | — |
| Bleached Toilet | 5.26 | @ | — |
| **Paper Towels—** | | | |
| Unbleached | 1.80 | @ | — |
| Bleached | 2.10 | @ | — |
| **Manila—per cwt.—C. l. f. a.** | | | |
| No. 1 Jute | $8.25 | @ | $10.25 |
| No. 2 Jute | 7.50 | @ | 9.50 |
| No. 1 Wood | 4.00 | @ | 5.25 |
| No. 2 Wood | 3.50 | @ | 4.00 |
| **Boards, per ton—** | | | |
| News | $27.50 | @ | $30.00 |
| Chip | 27.50 | @ | 30.00 |
| Sgl. Mla. Ll. Chip. | 42.50 | @ | 45.00 |
| Jute Lined Chip | 45.00 | @ | — |
| White Pat. Coated. | 55.00 | @ | 57.50 |
| Kraft Liners | $2.50 | @ | — |
| Binders Boards | 71.00 | @ | 77.00 |

**The following are representative of distributors' resale prices:—**

**Rag Content Bonds and Ledgers—**
**White, Assorted Items.**
**Delivered in Zone 1:**

| | Bonds | Ledgers |
|---|---|---|
| 100% Rag Ext. No. 1 | $41.40@$48.50 | $42.55@$50.00 |
| 100% Rag | 32.80@ 38.50 | 33.95@ 39.75 |
| 85% Rag | 31.65 | @37.25 |
| 75% Rag | 24.75@ 29.00 | 25.90@ 30.50 |
| 65% Rag | 21.65@ 26.25 | 22.80@ 27.75 |
| 50% Rag | 18.70@ 22.75 | 19.90@ 24.25 |
| 25% Rag | 15.80@ 19.25 | 16.95@ 20.75 |

**Regular Colors @ $1.50 cwt. extra.**
**Heavy Colors @ $3.00 cwt. extra**

**Sulphite Bonds and Ledgers—**
**White, Assorted Items.**
**Delivered in Zone 1:**

| | Bonds | Ledgers |
|---|---|---|
| No. 1 | $8.80@$10.75 | $9.95@$12.00 |
| No. 2 | 7.90@ 9.50 | 9.05@ 11.00 |
| No. 4 | 7.00@ 8.50 | 8.20@ 10.00 |

**Colors $1.00 cwt. extra.**

**Tree Sheet Book Papers—**
**White, Cased Paper.**
**Delivered in Zone 1:**

| | | |
|---|---|---|
| No. 1 Glossy Coated | $12.15 | @$14.25 |
| No. 2 Glossy Coated | 10.55 | @ 12.25 |
| No. 3 Glossy Coated | 9.35 | @ 11.00 |
| No. 4 Glossy Coated | 8.80 | @ 10.50 |
| No. 1 Antique (watermarked) | 8.80 | @ 10.50 |
| No. 2 Offset | 8.05 | @ 9.50 |
| A Grade E. F. | 7.90 | @ 9.50 |
| A Grade S. & S. C. | 8.15 | @ 9.75 |
| B Grade E. F. | 7.30 | @ 8.75 |
| B Grade S. & S. C. | 7.55 | @ 9.00 |
| C Grade E. F. | 7.00 | @ 8.50 |
| C Grade S. & S. C. | 7.25 | @ 8.75 |
| D Grade E. F. | 6.75 | @ 8.25 |
| D Grade S. & S. C. | 7.00 | @ 8.50 |

**Ivory & India at $.50 cwt. extra.**

## Mechanical Pulp

**(On Dock, Atlantic Ports)**

| | | | |
|---|---|---|---|
| **No. 1 Imported—** | | | |
| Moist | 27.00 | @ | 30.00 |
| Dry | 27.00 | @ | 30.00 |
| **(Delivered)** | | | |
| No. 1 Domestic and Canadian | 29.00 | @ | 33.00 |

## Chemical Pulp

**(On Dock, Atlantic, Gulf and West Coast Ports)**

| | | | |
|---|---|---|---|
| **Bleached Sulphite (Domestic and Foreign)—** | | | |
| Prime Bleached Sulphite | 2.50 | @ | 3.00 |
| **Prime Qualities—** | | | |
| Easy-Bleaching Sulphite | 2.25 | @ | 2.50 |
| Strong Unbleached Sulphite | 2.00 | @ | 2.25 |
| **(On Dock, Atlantic Ports)** | | | |
| Kraft Bleached | 2.75 | @ | 3.25 |
| Kraft Light & Strong | 2.00 | @ | 2.25 |
| Kraft No. 1 | 1.85 | @ | 2.15 |
| Kraft No. 2 | 1.75 | @ | 1.90 |
| **(F.o.b. Pulp Mill)** | | | |
| Kraft Domestic | 1.75 | @ | 2.35 |
| **(Delivered)** | | | |
| Soda Bleached | 2.70 | @ | — |

**Add 60 cents per short ton, dock charges for Albany; $2.50 for Lake Ports East and $3.50 for Lake Ports West of Mackinac Straits.**

## Domestic Rags

**New Rags**

**(Prices to Mill f. o. b. N. Y.)**

| | | | |
|---|---|---|---|
| **Shirt Cuttings—** | | | |
| New White, No. 1 | 6.00 | @ | 6.25 |
| Silesias No. 1 | 5.00 | @ | 5.25 |
| New Unbleached | 6.25 | @ | 6.50 |
| Blue Overall | 4.00 | @ | 4.50 |
| Fancy | 2.25 | @ | 2.50 |
| Washables | 1.80 | @ | 1.90 |
| Mixed Khaki Cuttings | 3.60 | @ | 3.75 |
| O. D. Khaki Cuttings | 4.35 | @ | 4.50 |

**Old Rags**

| | | | |
|---|---|---|---|
| **White, No. 1—** | | | |
| Repacked | 3.40 | @ | 3.50 |
| Miscellaneous | 2.75 | @ | 3.00 |
| **White, No. 2—** | | | |
| Repacked | 2.10 | @ | 2.25 |
| Miscellaneous | 1.70 | @ | 1.80 |
| **Thirds and Blues—** | | | |
| Repacked | 1.40 | @ | 1.50 |
| Miscellaneous | 1.25 | @ | 1.30 |
| **Roofing Rags—** | | | |
| No. 1 | 1.00 | @ | 1.15 |
| No. 2 | .75 | @ | .80 |
| No. 3 (bagging) | .65 | @ | .70 |
| No. 4 | .65 | @ | .70 |
| No. 5A | .65 | @ | .70 |

## Foreign Rags

**New Rags**

| | | | |
|---|---|---|---|
| New Dark Cuttings | 2.25 | @ | 2.40 |
| New Mixed Cuttings | 2.00 | @ | 2.20 |
| New Light Silesias | 5.50 | @ | 5.75 |
| Light Flannelettes | 5.50 | @ | 5.75 |
| New White Cuttings | 7.00 | @ | 7.50 |
| New Light Oxford | 4.00 | @ | 4.50 |
| New Light Prints | 3.00 | @ | 3.25 |

**Old Rags**

| | | | |
|---|---|---|---|
| No. 1 White Linens | 7.50 | @ | 8.50 |
| No. 2 White Linens | 6.50 | @ | 7.50 |
| No. 3 White Linens | 4.50 | @ | — |

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**PRESSES**

Whether it's a roll of bread wrap 80" wide—a web of cement bag paper 40" wide—or a roll of tape 2" wide . . . there is a POTDEVIN press to print it.

Presses supplied to print aniline, oil-ink, rotogravure or combinations of these—from one to 8 colors.

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18 hours a week in Plant B
24 hours a week in Plant C
Full time in Potdevin Machine Co.

The fear of the future evidenced everywhere seems to be emphatically lacking at Potdevin. Their Plant 1, 1223 38th St., Brooklyn, N. Y., is booked solid with sold work for almost the rest of the year.

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Printing presses and paper bag machinery take up a large part of the quota.

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1223 38th Street

Established 1893

| | | | |
|---|---|---|---|
| No. 4 White Linens. | 2.25 | @ | 3.25 |
| No. 1 White Cotton. | 4.25 | @ | 4.75 |
| No. 2 White Cotton. | 3.25 | @ | 3.75 |
| No. 3 White Cotton. | 2.50 | @ | 3.00 |
| No. 4 White Cotton. | 1.90 | @ | 2.20 |
| Extra Light Prints.. | 2.00 | @ | 2.40 |
| Ord. Light Prints... | 1.75 | @ | 2.15 |
| Med. Light Prints... | 1.55 | @ | 1.95 |
| Dutch Blue Cottons.. | 2.25 | @ | 2.50 |
| French Blue Linens.. | 3.00 | @ | — |
| Checks and Blues... | 2.00 | @ | — |
| Linsey Garments.... | 1.90 | @ | 2.00 |
| Dark Cottons..... | 1.50 | @ | 1.60 |
| Old Shopperies..... | 1.30 | @ | 1.45 |
| New Shopperies..... | 1.45 | @ | 1.50 |
| French Blues..... | 2.25 | @ | 2.50 |

### Old Rope and Bagging

Prices to Mill f. o. b. N. Y.)

| | | | |
|---|---|---|---|
| Gunny No. 1— | | | |
| Foreign ..... | 2.25 | @ | 2.35 |
| Domestic ..... | 2.20 | @ | 2.25 |
| Wool Tares, light.... | 1.50 | @ | 1.75 |
| Wool Tares, heavy.. | 2.00 | @ | 2.10 |
| Bright Bagging..... | 1.60 | @ | 1.70 |
| Manila Rope— | | | |
| Foreign ..... | 2.50 | @ | 2.75 |
| Domestic ..... | 2.75 | @ | 2.90 |
| Jute Threads..... | 2.75 | @ | 3.00 |
| Sisal Strings..... | 1.75 | @ | 2.00 |
| Mixed Strings..... | .60 | @ | .70 |

### Old Waste Papers

(F. o. b. New York)

| | | | |
|---|---|---|---|
| Shavings— | | | |
| White Envelope Cuttings ..... | 2.35 | @ | 2.50 |
| Ordinary Hard White No. 1.... | 1.90 | @ | 2.00 |
| Soft White No. 1.. | 1.80 | @ | 2.20 |
| Flat Stock— | | | |
| Stitchless ..... | .70 | @ | .80 |
| Overissue Mag..... | .60 | @ | .70 |
| Solid Flat Book... | .55 | @ | .60 |
| Crumbled No. 1... | .40 | @ | .45 |
| Ledger Stock..... | .90 | @ | .95 |
| New B. B. Chips.... | .15 | @ | .20 |
| Manila— | | | |
| New Env. Cut.... | 1.85 | @ | 2.00 |
| New Cuttings..... | 1.50 | @ | 1.60 |
| Old Kraft Machine— | | | |
| Compressed bales.. | .60 | @ | .70 |
| News— | | | |
| No. 1 White News | 1.25 | @ | 1.30 |
| Strictly Overissue. | .45 | @ | .50 |
| Strictly Folded.... | .20 | @ | .25 |
| No. 1 Mixed Paper.. | .05 | @ | .10 |

### Twines

(F. o. b. Mill)

| | | | |
|---|---|---|---|
| (Soft Fiber) | | | |
| Coarse Polished— | | | |
| India ..... | .11 | @ | .13 |
| White Hemp..... | .12 | @ | .14 |
| Fine Polished— | | | |
| Fine India..... | .15 | @ | .17 |
| Unpolished— | | | |
| Box ..... | .08½ | @ | — |
| Paper Makers..... | .07½ | @ | .08½ |
| Tube Rope..... | .09 | @ | .10 |
| Wall Paper..... | .10 | @ | .11 |
| Wrapping ..... | .11 | @ | .13 |
| Soft Fiber Rope... | .09½ | @ | .11½ |
| Cotton ..... | .15 | @ | .20 |
| (Hard Fiber) | | | |
| Medium Java..... | .09 | @ | .10 |
| Mex. Sisal..... | .08½ | @ | .09½ |
| Manila ..... | .18 | @ | .25 |

| | | | |
|---|---|---|---|
| Domestic ..... | 2.25 | @ | 2.50 |
| Sisal Rope..... | 1.65 | @ | 1.85 |
| Mixed Rope..... | .50 | @ | .75 |
| Transmission Rope.... | 1.50 | @ | 1.75 |
| Soft Jute Ropes..... | 1.75 | @ | 1.90 |
| Jute Carpet Threads. | .90 | @ | 1.25 |
| Gunny Bagging— | | | |
| Foreign ..... | 2.30 | @ | 2.35 |
| Domestic ..... | 1.85 | @ | 1.95 |
| Bleachery Burlap.... | 3.25 | @ | 3.75 |
| Scrap Burlap— | | | |
| Foreign ..... | 1.50 | @ | 1.60 |
| Domestic ..... | 1.25 | @ | 1.50 |
| Scrap Sisal ..... | 1.25 | @ | 1.50 |
| Scrap Sisal for Shredding ..... | 1.75 | @ | 1.90 |
| Wool Tares, Heavy.. | 1.50 | @ | 1.60 |
| New Burlap Cuttings | 1.75 | @ | 2.00 |
| Aust. Wool Pouches. | 2.85 | @ | 3.10 |
| Heavy baling bagging | 1.85 | @ | 2.00 |
| Paper Mill Bagging.. | 1.00 | @ | 1.15 |
| No. 2 Bagging..... | .60 | @ | .70 |

### Domestic Rags (New)

(F. o. b. Boston)

| | | | |
|---|---|---|---|
| Shirt Cuttings— | | | |
| New Light Prints. | .03 | @ | .03¼ |
| New White No. 1... | .06½ | @ | .06¾ |
| New White No. 2. | .05 | @ | .05½ |
| New Light Flannelettes ..... | .04¼ | @ | .04¾ |
| Silesias No. 1..... | .04¼ | @ | .04¾ |
| New Black Silesias.. | .03¾ | @ | .04 |
| Silesias No. 1 Soft Unbleached..... | .06¾ | @ | .07 |
| Blue Cheviots..... | .05 | @ | .05¼ |
| Fancy ..... | .03 | @ | .03¼ |
| Washable ..... | .02¾ | @ | .03 |

| | | | |
|---|---|---|---|
| Cottons—According to grades— | | | |
| Blue Overalls..... | .04¾ | @ | .05 |
| New Black, soft... | .03¾ | @ | .04 |
| Khaki Cuttings.... | .03¼ | @ | .03¾ |
| O. D. Khaki..... | .04 | @ | .04½ |
| Corduroy ..... | .02¾ | @ | .03 |
| New Canvas..... | .06¾ | @ | .07¼ |
| B.V.D. Cuttings..... | — | @ | .06½ |

### Domestic Rags (Old)

(F. o. b. Boston)

| | | | |
|---|---|---|---|
| Canvas ..... | .04½ | @ | — |
| White No. 1— | | | |
| Repacked ..... | — | @ | 2.75 |
| Miscellaneous ..... | 2.50 | @ | 2.75 |
| White No. 2— | | | |
| Repacked ..... | 1.90 | @ | 2.00 |
| Miscellaneous ..... | 2.00 | @ | 2.25 |
| Twos and Blues..... | 1.75 | @ | 2.00 |
| Third and Blues— | | | |
| Repacked ..... | 1.37½ | @ | 1.75 |
| Miscellaneous ..... | 1.25 | @ | 1.62½ |
| Black Stockings..... | 3.90 | @ | 4.00 |
| Roofing Stock— | | | |
| No. 1..... | 1.00 | @ | 1.10 |
| No. 2..... | .75 | @ | .85 |
| No. 3..... | .65 | @ | .70 |

### Foreign Rags

(F. o. b. Boston)

| | | | |
|---|---|---|---|
| Dark Cottons..... | 1.00 | @ | 1.05 |
| Dutch Blues..... | 2.65 | @ | 2.75 |
| New Checks and Blues | 2.85 | @ | 3.00 |
| Old Fustians..... | 2.25 | @ | 2.50 |
| Old Linsey garments. | 1.75 | @ | 1.90 |
| New Silesias..... | 6.00 | @ | 6.50 |

## PHILADELPHIA

### Domestic Rags (New)

(Price to Mill, f. o. b. Phila.)

| | | | |
|---|---|---|---|
| Shirt Cuttings— | | | |
| New White, No. 1. | .05½ | @ | .06 |
| New White, No. 2. | .03½ | @ | .04 |
| Light Silesias..... | .04 | @ | .04½ |
| Silesias, No. 1.... | — | @ | .04½ |
| Black Silesias, soft. | .03 | @ | .03½ |
| New Unbleached.. | — | @ | .06 |
| Washable, No. 1.. | .01¼ | @ | .01½ |
| Blue Overall..... | .04 | @ | .04½ |
| Cottons—According to grades— | | | |
| Washable No. 2... | .01 | @ | .01¼ |
| New Blue..... | .01 | @ | .01¼ |
| Fancy Percales.... | — | @ | .02½ |
| New Black Soft... | .03 | @ | .03½ |
| New Light Seconds | — | @ | .04½ |
| New Dark Seconds | .50 | @ | .75 |
| Khaki Cuttings— | | | |
| No. 1 O. D..... | .03½ | @ | .04 |
| No. 2 Mixed..... | .02 | @ | .02½ |
| Corduroy ..... | — | @ | .02 |
| New Canvas..... | .05 | @ | .05½ |
| New Black Mixed. | .02½ | @ | .02¾ |

### Domestic Rags (Old)

| | | | |
|---|---|---|---|
| White No. 1— | | | |
| Repacked ..... | 3.50 | @ | 4.00 |
| Miscellaneous ..... | 2.00 | @ | 2.25 |
| Thirds and Blues— | | | |
| Miscellaneous ..... | 1.00 | @ | 1.25 |
| Repacked ..... | 1.50 | @ | 1.75 |
| Black Stockings (Export) ..... | 3.00 | @ | 3.50 |
| Roofing Stock— | | | |
| Foreign No. 1.... | — | @ | .75 |
| Domestic No. 1... | — | @ | 1.00 |
| Domestic No. 2... | — | @ | .85 |
| Roofing Bagging.. | — | @ | .70 |

### Bagging

(F. o. b. Phila.)

| | | | |
|---|---|---|---|
| Gunny, No. 1— | | | |
| Foreign ..... | 1.50 | @ | 1.75 |
| Domestic ..... | 1.50 | @ | 1.75 |
| Manila Rope..... | 3.00 | @ | 3.25 |
| Sisal Rope..... | — | @ | 1.50 |
| Mixed Rope..... | .75 | @ | 1.00 |
| Scrap— | | | |
| No. 1..... | — | @ | 1.50 |
| No. 2..... | 1.00 | @ | 1.25 |
| Wool Tares, heavy.. | 3.25 | @ | 3.50 |
| Mixed Strings..... | 1.00 | @ | 1.10 |
| No. 1 New Light Burlap ..... | 3.00 | @ | 3.50 |
| New Burlap Cuttings | 1.75 | @ | 2.00 |

### Old Papers

(F. o. b. Phila.)

| | | | |
|---|---|---|---|
| Shavings— | | | |
| No. 1 Hard White. | 2.15 | @ | 2.20 |
| No. 2 Hard White. | 2.00 | @ | 2.10 |
| No. 1 Soft White.. | 1.80 | @ | 1.90 |
| No. 2 Soft White.. | 1.25 | @ | 1.30 |
| No. 1 Mixed..... | .70 | @ | .75 |
| Solid Ledger Stock.. | 1.50 | @ | 1.60 |
| Ledger Stock, white. | 1.00 | @ | 1.50 |
| Ledger Stock, colored | .75 | @ | .80 |
| No. 1 Books, heavy.. | .65 | @ | .70 |
| Manila Cuttings..... | 1.50 | @ | 1.75 |
| Print Manila..... | .30 | @ | .35 |
| Container Manila.... | — | @ | .40 |
| Kraft Paper..... | .75 | @ | .80 |
| No. 1 Mixed Paper.. | .15 | @ | .20 |
| Straw Board Chip... | .25 | @ | .30 |
| Binders Board Chip. | .25 | @ | .30 |
| Corrugated Board... | .50 | @ | .55 |
| Overissue News..... | .50 | @ | .55 |
| Old Newspapers..... | .25 | @ | .30 |

## BOSTON

### Old Papers

(F. o. b. Boston)

| | | | |
|---|---|---|---|
| Shavings— | | | |
| No. 1 Hard White. | 2.25 | @ | 2.40 |
| No. 1 Soft White.. | 1.85 | @ | 2.15 |
| No. 2 Mixed..... | .75 | @ | .80 |
| Solid Ledger Books.. | 1.50 | @ | 1.75 |
| Overissue Ledger Stock ..... | 1.30 | @ | 1.50 |
| Mixed Ledgers..... | .85 | @ | .90 |
| No. 1 Books, heavy.. | .65 | @ | .75 |
| No. 1 Books, light... | .65 | @ | .75 |
| Crumpled Stitchless Book Stock..... | .55 | @ | .65 |
| Manila Env. Cuttings | 1.60 | @ | 1.70 |
| Manila Envelope Cuttings, extra quality | 2.10 | @ | 2.20 |
| No. 1 Old Manila... | .95 | @ | 1.00 |
| White Blank News.. | 1.30 | @ | 1.40 |
| No. 1 Kraft..... | .90 | @ | — |
| Mixed Papers..... | — | @ | .10 |
| Print Manila..... | .45 | @ | .50 |
| Container Manilas... | 27½ | @ | — |
| Old Newspapers..... | .25 | @ | .32½ |
| Paper Wool Strings.. | .75 | @ | — |
| Overissue News..... | .45 | @ | .50 |
| Box Board Chips..... | .20 | @ | .25 |
| Corrugated Boxes.... | .27½ | @ | .30 |
| Kraft corrugated boxes | .65 | @ | .70 |
| Screening Wrappers.. | .40 | @ | .45 |

### Bagging

(F. o. b. Boston

| | | | |
|---|---|---|---|
| Manila Rope— | | | |
| Foreign ..... | 2.75 | @ | 2.85 |

## CHICAGO

### Old Papers

(F. o. b. Chicago)

| | | | |
|---|---|---|---|
| Shavings— | | | |
| No. 1 White Envelope Cuttings.... | 1.80 | @ | 1.90 |
| No. 1 Hard White. | 1.70 | @ | 1.80 |
| No. 1 Soft White.. | 1.50 | @ | — |
| Ledger & Writings.. | .75 | @ | .80 |
| Solid Books..... | .55 | @ | — |
| Blanks ..... | .90 | @ | — |
| Krafts ..... | .60 | @ | — |
| New Kraft Cuts..... | 1.10 | @ | — |
| Manila Env. Cuts... | Nominal | | |
| Ex. No. 1 Manila... | Nominal | | |
| Print Manila..... | Nominal | | |
| Overissue News..... | .35 | @ | — |
| Old Newspapers— | | | |
| No. 1 Folded News | .30 | @ | — |
| No. 1 Mixed Paper | .20 | @ | — |
| Roofing Stocks— | | | |
| No. 1..... | 2.00 | @ | 2.10 |
| No. 2..... | 1.85 | @ | 2.00 |

## TORONTO

### Paper

### Bonds and Ledgers

Delivered

| | | | |
|---|---|---|---|
| No. 1 White ..... | .36½ | @ | — |
| No. 1 Tints ..... | .37½ | @ | — |
| No. 2 White ..... | .26½ | @ | — |
| No. 2 Tints ..... | .27½ | @ | — |
| No. 4 White ..... | — | @ | .1550 |
| No. 4 Tints .....16.50 | | @ | — |
| No. 5 Bond—White 11.85 | | @ | — |
| No. 5 Bond—Tints .12.85 | | @ | — |
| Bond—Golden Rod .....13.35 | | @ | — |
| No. 5 Ledger—White .1185 | | @ | — |
| No. 5 Ledger—Tints. .1285 | | @ | — |
| No. 6 Bond—White .10.75 | | @ | — |
| No. 6 Bond—Tints .11.25 | | @ | — |
| No. 6 Bond—Golden Rod .....12.75 | | @ | — |
| No. 7 Bond—White 9.10 | | @ | — |
| No. 7 Bond—Tints 9.60 | | @ | — |
| No. 7 Bond—Golden Rod .....11.10 | | @ | — |
| Book— | | | |
| No. 1 M. F. ..... 7.35 | | @ | — |
| No. 2 M. F. ..... 6.85 | | @ | — |
| No. 3 M. F. ..... 5.60 | | @ | — |
| No. 1 S. C. ..... 7.60 | | @ | — |
| No. 2 S. C. ..... 7.10 | | @ | — |
| No. 1 Coated Book and Litho .....12.50 | | @ | — |
| No. 2 Coated Book and Litho .....11.00 | | @ | — |
| No. 3 Coated Book and Litho .....10.00 | | @ | — |
| Coated tinted.....13.50 | | @ | — |

| | | | |
|---|---|---|---|
| Wrapping —delivered— | | | |
| Rag Brown..... | 4.85 | @ | 5.55 |
| White Wrap..... | 4.00 | @ | — |
| "B" Manila..... | 4.90 | @ | 6.25 |
| No. 1 Manila..... | 5.50 | @ | 7.00 |
| Fiber ..... | 5.50 | @ | — |
| Kraft No. 2 | | | |

(F. o. b. Cars, Toronto)

| | | | |
|---|---|---|---|
| News per ton— | | | |
| Rolls (contract)..$50.00 | | @ | — |
| Sheets .....69.50 | | @ | — |

### Pulp

| | | | |
|---|---|---|---|
| Ground wood.....29.50 | | @ | — |
| Unbleached Sulphite.54.00 | | @ | — |
| Book (Class 1).....64.00 | | @ | — |
| Writing (Class 2)...62.00 | | @ | — |
| Select (Class 3).... 63.00 | | @ | — |
| Kraft .....50.00 | | @ | — |
| Soda .....56.00 | | @ | — |

### Old Waste Paper

(In carload lots, f. o. b. Toronto

| | | | |
|---|---|---|---|
| Shavings— | | | |
| White Env. Cut... | 2.25 | @ | — |
| Soft White..... | 2.15 | @ | — |
| White Blk. News.. | 1.25 | @ | — |
| Book and Ledger— | | | |
| Flat Magazine and Book Stock (old) | .80 | @ | — |
| Light and Sampled Book Stock. | .75 | @ | — |
| Ledgers and Arti ings ..... | 1.10 | @ | — |
| Manilas— | | | |
| New Manila Cut... | 1.35 | @ | |
| Printed Manilas... | .45 | @ | — |
| Kraft ..... | .95 | @ | — |
| News and Scrap— | | | |
| Strictly Overissue. | .50 | @ | — |
| Strictly Folded.... | .45 | @ | — |
| No. 1 Mixed Paper.. | .30 | @ | — |

### Domestic Rags

(Price to mills, f. o. b. Toronto

| | | | |
|---|---|---|---|
| No. 1 White Shirt Cuttings ..... | .06½ | @ | .06¾ |
| Fancy Shirt Cuttings | .02¼ | @ | .02½ |